American
HOROLOGIST
and
JEWELER

A
JOB
HAS BEEN WAITING
FOR EVERY
ELGIN GRADUATE

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HERE →

This remarkable employment record is one reason why Elgin Watchmakers College has been called the leading watchmaking school in America.

Owned and operated by Elgin National Watch Company, the College offers a complete, 15-month course in watchmaking, repairing, selling, and jewelry store management.

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ELGIN
WATCHMAKERS COLLEGE

ELGIN WATCHMAKERS COLLEGE
267 S. Grove Avenue, Box 58
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Send free booklet giving complete details.

Name _____

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NOW! FLEX-LET BRINGS YOU

the soundest selling idea in watch-band history

WATCH REPAIR DEPT.

"watch band merchandiser"

Makes it easy as A-B-C to

DOUBLE YOUR PROFITS ON EVERY WATCH REPAIR JOB!

Closed for watch inspection—*open* for watch band sales, helps your watchmaker turn every repair job into a watch band sale—*automatically*, because—

A Velvet service pad on MERCHANDISER provides a luxurious contrast when customer's watch with shabby band is placed on it.

B MERCHANDISER keeps new bands at watchmaker's fingertips, so he can say—"All you need now is a new band like this one and you have an entirely new, modern wrist watch."

C Repaired watch and new band placed on the velvet cushion make the watch band sale irresistible.

MERCHANDISER *FREE!* with 2 each of the 10 top-selling Flex-Let bands* — 5 ladies' styles and 5 men's styles — including those shown in this 4-page advertisement.

BRINGS YOU . . $177.00 T.I.	
COST $63.00	
MERCHANDISER . FREE	
YOUR PROFIT . $114.00 T.I.	

**Specify your own style choices if you prefer.*

FREE! **"Selling Guide for the Watch Repair Department"**

12 quick tips on how to add a watch band sale to every watch repair job. Order as many copies as you need for your staff. Designed to help *you* CREATE sales!

TURN YOUR SERVICE AREA INTO A SELLING AREA!!! **ORDER YOUR MERCHANDISER TODAY!**

FLEX-LET CORPORATION

MEN'S AND WOMEN'S WATCH BANDS • BEAU BRUMMEL GENTLEMEN'S JEWELRY

580 FIFTH AVENUE, NEW YORK 36 • CANADA: NORLÉ, LTD., MONTREAL

PRESENTING AN OLD FRIEND . . .

to some good friends of yours

Surely most of your customers have seen the familiar face of Norman Rockwell's "Jeweler." He's appeared in the pages of their favorite magazines . . . they've seen him in your store, in window and counter displays. And every time they see him, they're reminded of the many fine products and services you offer.

Next month they're going to see him again. And they're going to see another great display that ties right in with the ad because it features the fine jeweled-lever Swiss watches you sell. For details, please turn the page.

Your modern Wonderland of Time

Remember Alice? She stepped through the looking-glass to see wonders beyond belief.

Enter your own Wonderland through your jeweler's door—to marvel at the miracles of Time that must be seen to be believed.

Self-winding, water-resistant, shock-resistant watches—your jeweler has them. Created by Swiss craftsmen, they're the most wanted timepieces today.

Visit your jeweler's Wonderland soon . . . to see a bit of Switzerland, to see fine jeweled-lever watches. *For the gifts you'll give with pride, let your jeweler be your guide.*

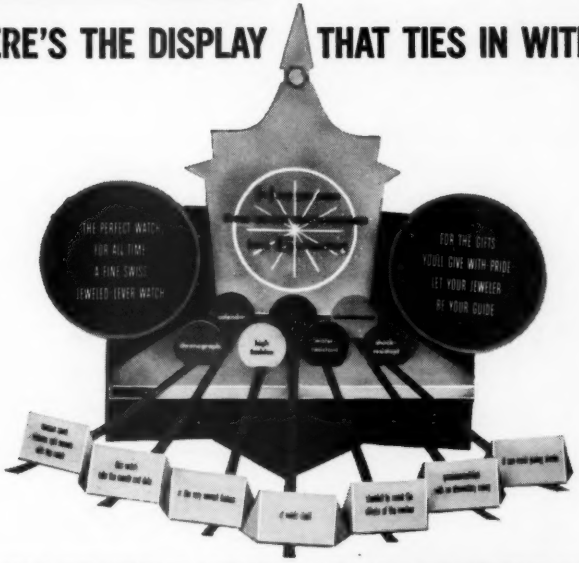
The Watchmakers of Switzerland

TIME IS THE ART OF THE SWISS

HERE'S "THE JEWELER"
Appearing in March, 1955

Your customers will see "The Jeweler" in LIFE, LOOK, THE SATURDAY EVENING POST and THE FARM JOURNAL—with a total readership of 46 million. And when they read its friendly message, they'll be reminded of *you*.

AND HERE'S THE DISPLAY THAT TIES IN WITH IT...



HELPS YOU FEATURE YOUR SPECIAL-FEATURE WATCHES

Frankly, *here's* a display you've asked for. *Here* is a window "spectacular" tailor-made to *your* requirements. We honestly believe it's the most effective display piece we've ever designed for you.

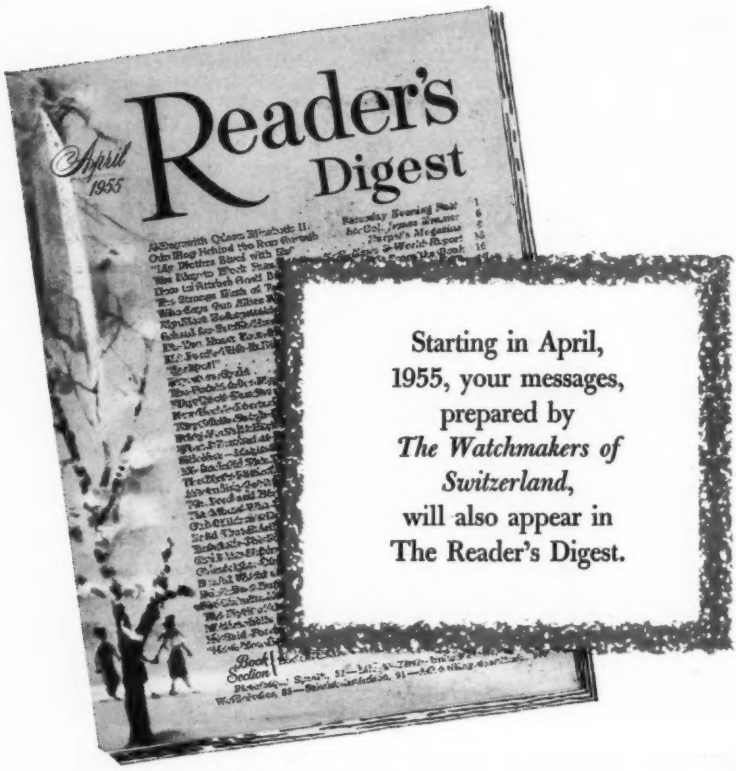
Note how it promotes special-feature watches . . . and lets *you* use watches out of stock to enhance its beauty. Because it's a year-round display, you can change the watches from time to time to lend continuing interest to your window.

Its three-dimensional effect is heightened by rich, eye-catching colors, and its over-all size is 23″ wide x 21″ high.

HOW TO ORDER:

In the next few days, you'll receive in the mail an order card. Simply fill it in, return it, and your new Special-Feature Watch Display will be on its way to you. Free of charge, of course.

And for news of something very special in April, 1955— *Please turn the page...*



- It's the very first time an advertisement ever appeared in The Reader's Digest!
- It's America's best loved magazine!
- 10 million families will receive copies of it!
- 35 million people will read it.
- It's the mightiest magazine audience in the world.
- And it's a *brand new* group of readers—the kind of customers you want in your store.

"For the gifts you'll give with pride, let your jeweler be your guide."

THE WATCHMAKERS OF SWITZERLAND

Prove It to Yourself!

STOP "COME-BACKS" WITH **TESTED**

P M Onyx Products

COMPLETELY
DEPENDABLE

EXCLUSIVE PM SUPERIOR

ONYX-STEEL

MAINSPRINGS

P M STAFFS & STEMS

FOR ALL SWISS & AMERICAN WATCHES

CHECK THE FACTS!

√ Our *Unconditional Guarantee* has protected Watchmakers for more than a decade-and-a-half!

√ PM QUALITY saves you time and money—assures you *Greater Profits!*

ASK ANYONE IN THE TRADE
AND CONSULT YOUR JOBBER!

PM

Sole Distributors

P. MEREMINSKY

15 Maiden Lane • New York 38, N. Y.

American
HOROLOGIST
and
JEWELER

Volume 22 No. 2

February, 1955

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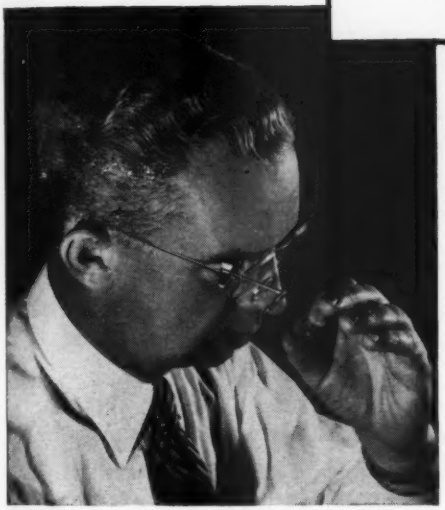
New!

EYEGLASS LOUPES



Use on either "shell" or metal eyeglass frames

Single lens models 3×, 3.3×, 4×, 5×, or 7× **$3.25**

Double lens models 4× and 7× **$5.25**

All the eye comfort, all the sparkling, clear image of the regular Bausch & Lomb loupes are now available to eyeglass wearers. And this new design fits just as quickly and easily on plastic as on metal spectacles. Instantly interchangeable, if you wish. Single or double lens models. Lenses swing in and out of range on sturdy spring pivot. Attractive gold finish. Built for a lifetime of satisfying service. From your supplier, or write: Bausch & Lomb Optical Co., 52038 Bausch Street, Rochester 2, New York.

BAUSCH & LOMB

SINCE B&L 1853

SAVE 100% on this Special Insignia DIAL IMPRINTING OFFER!

For a LIMITED TIME ONLY!

Here is an exceptional offer — imprinting any two Watch Dials with any of the 15 Insignias illustrated for only $1.00

It's a boon to extra business — because every man is proud to wear the Insignia identifying his Civic, Fraternal or Social Group!

2 for $1.00 only

This is a saving of 100% over our standard prices!

Why do we make this spectacular offer? Simply to acquaint you with our *superior* quality — our *lower* regular prices — our *better* Watch Dial Refinishing Service!

ONLY U.S. WATCH DIAL GUARANTEES:

- √ 1 Full Year written Guarantee against tarnish or discoloration on all Dial Refinishing!
- √ FREE REFINISHING if you scratch or mar any Dial refinished by us when fitting to movement!
- √ SAME DAY SERVICE ON THIS SPECIAL OFFER — and only 72 hours (maximum) on regular Dial Refinishing!

HOW TO ORDER:

1. Cut-out and mail Coupon with your two Dials. (For Imprinting Dial only, send Dial itself, or if you wish, simply remove bezel, hands and balance — then send movement in back of case. For Imprinting plus Dial Refinishing, send Dial only.)
2. Specify Code Numbers and Letters shown under illustrations, to be sure of getting correct Insignias.
3. State colors wanted, as follows: **For Black Dials:** Gold or White paint. **For Other Dials:** Red, Black or Blue paint.
4. Be sure to send all movements via Insured mail.

RE-ORDERS:

Insignia Imprinting only $1.00
Insignia Imprinting on Dial being Refinished .90

Act Quickly **This Special Offer positively expires April 30, 1955 —so act promptly!**

U.S. WATCH DIAL CO.
64-66 NASSAU STREET • NEW YORK 38, N.Y.

AMERICA'S OLDEST AND MOST RELIABLE DIAL REFINISHING HOUSE

The following 15 Emblems are available in our Special 2 for $1.00 Insignia Imprinting Offer

NAVY 3288A

ARMY 3288B

MARINES 3288C

32nd DEGREE 3289A

ROTARY 3290A

PAST MASTERS 3289B

K of C 3290B

AMERICAN LEGION 3291A

MOOSE 3290C

LIONS 3291B

V.F.W. 3292A

ELKS 3291C

KIWANIS 3292B

MASONIC 3351A

SHRINER 3292C

Note: Insignias Illustrated Exact Size

Keep this Chart for Future Reference

USE THIS COUPON NOW!

(PLEASE PRINT)

U.S. WATCH DIAL CO.
64 Nassau Street, New York 38, N.Y.
Gentlemen: Please imprint insignias on the accompanying two Watch Dials, as follows:

1. _____ _____ _____ (Color)
(Name of Dial) (Insignia No. & Letter)
2. _____ _____ _____ (Color)
(Name of Dial) (Insignia No. & Letter)

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

☐ Charge my Acct. ☐ Check enclosed ☐ Open an Acct.

OFFER EXPIRES APRIL 30, 1955

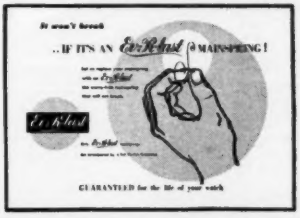
E430 4½ 13 10½"
Hk
Ev-R-last
MAINSPRING
GUARANTEED
for the life of your watch
GUARANTEE
This mainspring is guaranteed to be of highest quality and will be replaced free of charge if it breaks under normal conditions.

BUILD YOUR BUSINESS 3 WAYS with *Ev-R-last* THE QUALITY MAINSPRING

1. **ATTRACT NEW CUSTOMERS** into your store, by the counter display card and newspaper mat about this new worry-free mainspring.
2. **BUILD CONFIDENCE;** your satisfied repair customers will buy in your other departments and recommend you to others.
3. **INCREASE YOUR REPAIR PROFITS,** because you can charge more for Ev-R-last, the guaranteed mainspring. Show the printed guarantee on every Ev-R-last envelope.

Yes, smart jewelers everywhere are telling us success stories about Ev-R-last, how they have increased store traffic and repair profits by selling Ev-R-last. The Ev-R-last guarantee inspires confidence, and Ev-R-last lives up to it. Because Ev-R-last is made of a new alloy steel, its life is equal to or longer than any other part of a watch. It keeps its resiliency, is rust-resistant, and comes in 75 of the popular sizes. Yet Ev-R-last costs you only $3.00 per dozen.

Be sure you know about Ev-R-last and the prestige and profits it will bring to your store.



TO HELP YOU SELL — Use this attractive 2-color display card in your window, on your counter; it atracts customers into your store. Write for a free newspaper mat (3" x 2 columns) for your local advertising.

Write your material supply house for an Ev-R-last circular today.

HAMMEL, PIGLANDER & CO., INC. NEW YORK 16, N. Y.

Exclusive Wholesale Distributors

THE UP-TO-DATE SHOCK ABSORBER IS NAMED

RUBY SHOCK

Customers

are satisfied because RUBY SHOCK *really protects their watches from all shocks. To have the right time always, despite the hard conditions of wearing nowadays, is a boon due to the presence of* RUBY SHOCK *in watches.*

Watchmakers and dealers

are proud because they can display articles of choice quality, thus increasing the value of watches and urge the sales.

Seitz

LES BRENETS
Switzerland

Watch repairers

have known SEITZ *long since. They also know that* RUBY SHOCK *is easy to maintain and repair. So they keep in stock all the repair parts required.*

RUBY SHOCK IS SUITABLE FOR EVERYBODY

BESTFIT White-a-loy TRADE MARK

UNBREAKABLE WATCH SPRINGS

made of a special, acid resistant, non-magnetic unbreakable, permanent alloy — mirror polished — will not rust — will not score the barrel — will not set

72 popular sizes which cover over 900 different calibres are available now. More will follow.

$5.75 per doz. lot

#15135—1½x13½x6½
#213A—2x13x7½
#212C—2x12x8½
#212E—2x12x9½
#210H—2x10x10½
#2510F—2½x10x10
#313B—3x13x8
#312E—3x12x9½
#311E—3x11x9½
#311K—3x11x11½
#310H—3x10x10½
#3511H—3½x11x10½
#3511R—3½x11x14
#413E—4x13x9½
#413H—4x13x10½
#412E—4x12x9½
#411K—4x11x11½
#4514H—4½x14x10½
#4513E—4½x13x9½
#4513G—4½x13x10¼
#515C—5x15x8½
#514C—5x14x8½
#513C—5x13x8½
#513E—5x13x9½
#513H—5x13x10½
#512E—5x12x9½
#511H—5x11x10½
#511K—5x11x11½
#511P—5x11x13½
#510H—5x10x10½
#614H—6x14x10½
#613E—6x13x9½
#613H—6x13x10½
#611H—6x11x10½
#611K—6x11x11½
#611P—6x11x13½
#610H—6x10x10½
#610K—6x10x11½
#695M—6x9½x12½
#6514F—6½x14x10
#6511J—6½x11x11
#714E—7x14x9½
#713E—7x13x9½
#713H—7x13x10½
#712K—7x12x11½
#711H—7x11x10½
#711K—7x11x11½
#710H—7x10x10½

SPECIAL OFFER:

BESTFIT Ass't #W36 — 1 pc. ea. 36 numbers, boxed complete with chart. 3 doz..... **$17.95**

BESTFIT Ass't #W48 — 1 pc. ea. 48 numbers, boxed complete with chart. 4 doz..... **$23.75**

BESTFIT Ass't #W60 — 1 pc. ea. 36 numbers plus 1 ea. 12 CHRONOGRAPH SIZES, boxed complete with chart. 4 doz. **$25.50**

AND FOR CHRONOGRAPHS — 12 sizes for over 72 OF THE MOST POPULAR CALIBRES.

$7.50 per doz. lot

#3595R—Univ. 281
#47X—Univ. 285, 87
#48T—Valj. 23, 72, 72C
#419P—Lemania 27C12
#4575V—Landeron 48
#65V—Valj. 22, 71
#68V—Valj. 77
#65115—Valj. 69
#785V—Venus 175
#79Y—Venus 150
#865T—Angelus 215
#910N—Venus 170

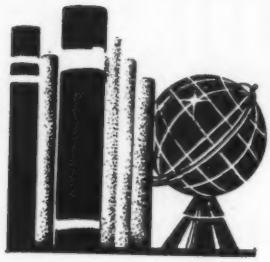
SPECIAL OFFER:

BESTFIT Ass't #WC12—1 pc. ea. 12 numbers for CHRONOGRAPH, boxed with chart..... **$7.65**

It is most important that BESTFIT "White-A-Loy" mainsprings are not confused with regular carbon steel mainsprings that may be, or appear, on the market. It does not necessarily follow that because a mainspring is white in color, it is manufactured of permanent white alloy and, therefore, rust proof, acid-resistant and unbreakable, as are BESTFIT "White-A-Loy" Mainsprings.

B. JADOW inc. • NEW YORK 3.

SOLD THROUGH WHOLESALERS ONLY



READ IT AND KEEP

Some merchants never seem to realize that no amount of turnover can survive a steady loss on operations. In the December 1954 issue of the Trader and Canadian Jeweller, Norman J. Leach, General Manager of the Canadian Jewellers' Association, had this to say on the subject of discount wars:

"I was selling in 1920-21 during the post-war depression. Discount sales raged up and down the street—10% off; 20% off; 25% off and finally the outfit I worked for went for the jackpot with 50% off! That was a honey of a sale. We had a uniformed man on the door letting people in a few at a time. Sales were terrific—BUT we closed up for good, ten days later. Boy, it was glorious—while it lasted."

American HOROLOGIST and JEWELER

Reducing Comebacks To a Minimum

Lecture Six-

Materials Used In A Watch

By Norman D. Luth

EVERYONE KNOWS that a watch is composed mainly of metals. When one looks into the matter a little more closely, one is surprised by the number of different metals and alloys that are used to make a fine watch. This surprise increases when one learns the different properties that certain of these alloys must possess and the difficulties that have had to be overcome in order to produce them. Add to this a list of the non-metallic materials indispensable to the making of a good quality watch, and surprise turns to wonderment. We are going to give a rapid survey of materials used in watches and chronometers from the points of view of their nature, properties and creation. Let us begin with the metals.

1. Carbon steel is high grade steel in which the carbon content varies between 1.1 and 1.2%, used for the arbors, pinions, ratchets, regulators, screws, winding parts, springs, levers, stud, hands, etc. This steel must be of the very best quality. The parts are carefully hardened and tempered so that they may possess, to the maximum, the mechanical properties required and in order to make it possible to give them a perfect finish and polish.

2. Brass is an alloy of copper and zinc, containing from 30 to 40% of the latter metal. The plates, bridges, wheels, barrel, barrel head, etc., are made of brass. The composition of this alloy varies slightly according to the mechanical operation it has to undergo. Thus the brass of the wheels contains 1 to 2% of lead to facilitate cutting. Moreover, mechanical treatments such as rolling must give it a suitable hardness and regularity. Metal dials are often made of brass.

3. Nickel silver is an alloy composed of 12 to 26% of nickel, 15 to 40% zinc—the remainder being copper. This is used for making balance wheels, small pins used as studs, and certain thin plates. At one time very frequently used in the manufacture of high quality rough movements or ebauches, it has been supplanted for this purpose by brass. Certain alloys very closely related to nickel silver are used for making ordinary metal cases which are subsequently chromium plated.

4. Beryllium bronze. This alloy with a copper base contains only 1 to 2.5% of beryllium. It is very resistant to fatigue and wear. After it has undergone the appropriate thermal treatment, its hardness and elasticity are comparable to those of steel hardened and tempered at approximately 572 degrees Fahrenheit. Beryllium bronze is known under the name of "Glucydur." It is used for making high quality non-metallic balance wheels, springs subject to fatigue, pivoting plugs, non-magnetic parts, etc.

5. Ferro-nickel alloys for hairsprings contain 30 to 40% of nickel with small amounts of manganese, chromium, molybdenum, tungsten, silicon, beryllium, titanium, columbium, aluminum, etc. These alloys have to be compensating; that is to say, making the running of a watch as free as possible from the influence of temperature, elastic, rustproof and non-magnetic as far as possible. This simultaneous achievement of the different properties has been obtained today, to a remarkable degree, although they are still not perfect.

6. Metals for electro-plating, which may be gold, rhodium or palladium where the plate and the bridges are concerned. These parts are often covered first with an intermediary coating of copper or nickel. Silver-plating, which was very popular at one time, has almost completely disappeared because it is too easily affected by outside agents. However, it is still fre-

quently used for dials. Chromium plating is only carried out on ordinary quality cases and bracelets; in the smarter models the plating is in gold.

7. Silver alloys, used for dials, cases and bracelets, have a silver content of usually 800 fine, and they contain therefore 20% of copper and other metals.

8. Gold and platinum alloys are used for cases and bracelets. By varying the ingredients, the gold alloys may be given shades bordering on pink, grey, green, yellow, etc.

9. Stainless steel for cases and bracelets. As a general rule it is a chromium nickel steel with 18% of chromium and 8% of nickel; and sometimes 12% of each. The carbon content is less than .02%. It also contains small quantities of manganese and silicon. Resistance to corrosion depends not only on the composition but also on the crystalline structure, influenced in its turn by the thermal and mechanical processes undergone by the case during manufacture. It has often happened that through faulty processing, cases have lost their property of resisting corrosion. In the long run, this has insidiously disintegrated them until finally they have fallen to pieces. Manufacturers of cases nowadays are aware of this danger and know how to avoid it. These cases sometimes possess the properties of being magnetic, although indefective stainless steel is not. It is a layer of oxide, caused by high temperature tempering which is left on the inside of the case in the horns or lugs that brings about this defect. Here, too, the cause has been found and a remedy discovered.

10. We must also mention almost pure copper—used as a metallic backing for enamel dials. This enamel is a triple silicate of potassium, lead and tin, and sometimes zinc.

11. Aluminum alloys, which have been used for many years for making cases of different colors. One alloy used for this purpose is "Reflectal" which contains a small per cent of magnesium and polishes very easily. The cases are colored and treated in a special electro-plating bath which deposits on the surface a hard layer of oxide of aluminum. This kind of aluminum is used to make imitation gold cases characterized by their light weight.

Non-metallic materials

In the field of non-metallic materials, the following products are used:

1. Corundum, which makes good quality stones or rubies. It is pure crystallized oxide of aluminum. Until the beginning of the century, only natural rubies were known and almost all of these came from the Indies. It was the French chemist, Verneuil, who discovered the process, making it possible to manufacture synthetic corundum. This is exactly the same material as natural corundum. The desired color is given to the synthetic by the addition of metallic oxides. In the jewelry trade it is known more and more by the general name of sapphire regardless of its color. The main advantage of corundum over other precious stones (except diamond) is its hardness, which has a value of 9 on the Mohs scale of hardness. In high quality watches the pivoting jewels, the lever pallets and the roller pins are almost always made of rubies. In less expensive watches the stones are of spinel, which is not quite so hard. Spinel is a crystallized aluminum oxide of magnesium, obtained synthetically. It is proper to also mention the use of diamond (pure carbon crystallized in the cubic system) as endstones of the balance wheel in large, high-precision chronometers such as ships' chronometers.

2. In certain particular cases, the ruby is replaced by tungsten carbide (commonly known as hard metal), due to its metallic appearance and a hardness almost equal to that of sapphire.

3. Silica glass for normal watch crystals. The silica content varies between 56 and 77%. The remainder is composed of various oxides (aluminum, lead, sodium, potassium, calcium, etc.) which influence the density, coefficient of expansion, color, index of refraction, melting point, resistance to acid, hardness and permeability to ultraviolet rays, etc. For watch crystals a quality is chosen without internal stress and whose coefficient of expansion is near to that of the bezel of the watch.

4. Unbreakable glass for sport and work watches. This is usually plexiglass, (polymethacrylate of methyl). This material comes in different consistencies, from a thick liquid to fairly hard solids of a cer-

tain fragility. For watches, a quality is chosen which can be bent to the requirements and shape of the case before being placed in the groove of the bezel. Unbreakable crystals must maintain their quality and must not change color with time, or shrink or check or craze. This last defect is more difficult to overcome or avoid, particularly because it is helped by the internal stresses as well as the proximity of certain other plastics used in the manufacture of bracelets and transparent wrappings.

5. Oils are always carefully and especially prepared for the specific purpose of their being used in watches. They are complex compounds, belonging to the hydrocarbon family. Watchmaking oils as a general rule are compounds of animal oils (ox's or sheep's foot, from unborn animals) and mineral oils or artificial oils with the addition of special products intended to make them as stable as possible. These oils are expected to be sufficiently fluid, non-acid, and are expected not to evaporate, spread or decompose in air or light, or to thicken in low temperatures.

It is understandable that all these properties cannot be completely obtained simultaneously, particularly as some of them are contradictory; for example, the more fluid an oil is, the better it resists thickening at low temperatures, but then more easily it spreads and evaporates at higher temperatures. Moreover, the deterioration depends also on the substance with which it is in contact and the surrounding atmosphere. It is not sufficient to choose the most appropriate oil. The places to be oiled have to be carefully prepared so that it will remain there in good condition for as long as possible.

6. Shellac is used for fixing the pallets to the lever and the pin to the roller. It is the resin of a tree from the Indies. Dissolved in alcohol it gives a kind of varnish that dries rapidly. This varnish adheres easily to the products with which it has a certain affinity, such as gutta-percha, rubber and resin. It should not be used on surfaces likely to come in contact with these materials. Shellac softens when heated. Its melting point is about 300 degrees Fahrenheit.

7. Plastic synthetic materials for bracelets, belonging to several types. It is necessary to choose those that keep their smart appearance when worn, without tarnishing or shrinking. Those used today include nylon, a compound of carbon, hydrogen, nitrogen and oxygen; and gurit, which is a chloride of vinyl.

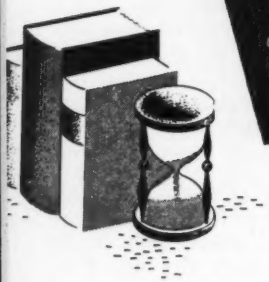
8. Luminous material for dials and hands, which are radioactive salts. For a long time a salt of mesothorium was used mixed with a zinc sulphide containing impurities such as copper and other metals. These impurities cause the luminescence and give a definite color to the luminous material. Since the radium industry has developed considerably, radium salts have become less expensive and have taken the place of salt of mesothorium. The presence of zinc sulphide and other materials, however, is still necessary. Luminous materials can be made in all shades similar to pastel colors. Their brilliancy diminishes with time. When they are new, it increases for a while before beginning to fade. The longer the brilliancy of a luminous material lasts, the better is its quality. Exposure to light or ultra-violet rays temporarily increase its brilliancy. It is not necessarily the most brilliant when new that will last the longest. Luminous raw material in the powder form is mixed with cellulose products before being laid on the hands and dial. According to certain modern trends, they are also placed on the inside edge of the bezel or even in cavities made in the glass.

9. Cellulose varnishes or lacquers are used for the coating of metals, such as dials, to protect them against oxidation. They have an acetone base in which a cellulose product and sometimes a dye have been dissolved. Their handling calls for certain precautions to be taken in order to avoid poisoning. The varnish is sprayed on by an air gun in an air-conditioned atmosphere totally free from dust. The least trace of dust on a dial would be an unacceptable defect.

10. Finally, mention must be made of the fabrics and natural leathers used for straps. These are acid by nature and precautions must be taken to avoid any harmful action on the watch.

Next month Dr. Sudbury will resume his discussion in this series on "Adjusting a Railroad Watch."

information PLEASE!



Details to check over in order to get a close running timepiece

How to get a clean chart

W. W. H.: I am having a lot of trouble in getting good clean charts on my timing machine. It seems that every time I take in a R. R. watch for repairs I cannot get close time. I check and put each watch in perfect order, but at that the chart will show spattered lines. Some run upwards and fast, some run downward and slow, while some lines are wavy. Do you think it is the fault of my timing machine or is it something about my work? I have worked at the bench for three years and learned my trade from a former watchmaker in my home town. Any suggestions you might give me will be appreciated.

Answer: Well, W. W. H., you don't give me much of an opening to make any suggestion to aid. When you say that you have repaired the watch and that it is in perfect order, that sounds final for both of us, but as you say that this has been your experience in handling a R. R. watch, it may be that your conception of perfect order may be lacking—perhaps in skill to handle such a watch. No doubt you have the skill and experience to handle what we call commercial work and now you are up against a new version of watch repairing. By that I mean the art of doing accurate work such as is called for on high grade watches. To successfully make a close running timepiece, I will mention the several small details to check over. Similar questions have appeared in past issues; however, for your benefit and perhaps some of our new subscribers, I will review what you must do to make certain that proper adjustments are made before you put your watch on the timing machine. Let us start by checking the hairspring—one of the important factors. The hairspring must be truly circled on hairspring collet and perfectly flat and the hairspring perfectly centered, the overcoil so shaped that the hairspring develops or breathes equally in all directions. It will be well to assure yourself that the collet fits tight. The regulator pins must be upright and parallel and as close as possible and still not impinge the hairspring—just enough freedom to satisfy yourself that the hairspring is free and playing between the pins.

We might then examine the balance pivots. Perhaps you repolished, then used a stone to remove lines and, in that case, may have created flat spots or an oval pivot. Perhaps the pivots are of different

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diameters—bent or tapered pivot ends are not alike, one end round and the other pivot flat. There could be a burred corner on one pivot, or perhaps a short pivot. If you find that the balance pivots are not 100 per cent perfect and you lack the skill to correct the trouble, put in a new staff. You may find the balance out-of-poise, or acting queer on the poising tool; any of the faults mentioned will prevent you from poising the balance wheel for perfect poise. Next, you can check the balance hole jewels. The holes must be of the same diameter and of the same thickness. Use olive hole jewels for replacements. The cap jewels can also cause trouble. You may find them pitted from wear, not perfectly flat, even loose. The space between the hole and cap jewel should not exceed .03 to .04 mm. for oil, and end shake for the balance should be .02 to .03 mm. Before poising the balance, see that the mean time screws are extending an equal number of turns or distance from the balance rim. Do not use the mean time screws for poising purposes. Then let's check the fork slot for wear or grooves caused by a sharp-edged roller jewel; the groove must be removed and a new roller jewel fitted to replace the old. You might then check the side shake of pallet arbor pivots. It is essential to eliminate all side shake with a new pallet arbor. Excessive side shake in pallet pivots is one cause of lost power and poor balance motion. End shake for the pallet arbor and end shake for the escape pinion must be of the same amount as allowed for the balance.

Let me say that a loose guard pinion or roller jewel will cause irregular time. Now the escape must be set to have a light, but safe, drop lock and also show slide, and there must be corner freedom for the passing of the roller jewel as it enters and exits from the fork slot. The guard pin must show freedom when the lever is at rest against the banking screw, which should be tested making certain it is tight and cannot shift. The train is then examined for rough pivots or cracked jewels or excessive side shake or end shake.

Then check the barrel making certain it runs true in flat and round and that it fits the arbor with minimum play. Also see that the barrel arbor is highly polished, then check the mainspring. It might be set too wide or too long or maybe too short. In either case, the watch cannot possibly keep good time. Procure a mainspring made by the manufacturer who made the watch.

See that the second hand fits tightly and that the cannon pinion does not rub on the plate when pressed onto the center arbor. See that the minute wheel is free as well as the hour wheel, and after the watch is cleaned and properly oiled is the time to test your watch on the timing machine. I feel sure the chart will show good quality lines and that the watch will have been restored to its original condition as it left the manufacturer. You will have learned a great deal about what makes a fine watch keep time. The balance should show from 1¼ to 1⅜ turns at the end of 24 hours; having a mainspring that delivers a constant torque, we might say, for 30 hours will cause constant motion to the balance and constant time. May I suggest you procure some of our late text books that are full of information and instruction on how to repair and adjust better grade watches. A list of books for your selection may be had on request by writing to the American Horologist & Jeweler Book Dept., Box 7127, Capitol Hill Station, Denver 6, Colorado.

Thread cutting formulae

J. R. D.: I have been reading your Information Please column for a good many years and enjoy it very much. Please give me the mathematical formula for determining the compounding gears for metric thread cutting on the watchmakers lathe, using a set of gears and also the thread cutting attachment as stated in the book by Louis and Samuel Levin, "Practical Benchwork for Horologists." (Third edition.)

Answer: Rules for screw gearing. Single Gearing: To cut a thread on a lathe it is necessary that the gear wheels which transmit motion from the cone spindle to the feed screw shall be of proportion to give the lathe carriage traverse per revolution to cut a thread of desired pitch. If the feed screw makes a revolution in the same time that the cone spindle does,

it is evident that the thread cut will be of the same pitch as the lead screw, provided that gear on the spindle and gear on the screw have an equal number of teeth. This applies to single gearing only "which means that no stud is to carry more than one gear." Should, however, the gear on spindle and the gear on lead screw not be large enough to mesh or meet, an "intermediate" gear should be used. This gear does not affect the relation of spindle gear to screw gear, but is used merely to fill in space between the gears and transmit motion from one to the other.

To figure the size gear to cut any pitch of thread, proceed as follows: Multiply the pitch of lead screw and the pitch of thread to be cut by the same multiplier and the result will be the number of teeth in gears to be placed, one on spindle and one on screw. Suppose we have a lathe whose lead screw is eight threads to the inch and we desire to cut 24 threads. Pitch of lead screw, $8 \times 2 = 16$, number of teeth in spindle gear; pitch of thread to be cut, $24 \times 2 = 48$, number of teeth in screw gear. Any number may be used as a multiplier—as 2, 3, 4, 5 or 6.

Compound Gear: The term "compound geared" as applied to screw cutting lathes means that there is placed between the gear on the lathe spindle and the gear on the screw, two gear wheels of different diameters and revolving side by side at the same number of revolutions, by reason of being fixed on the same sleeve or axis. To find the number of teeth in the wheel required to be placed on the feed screw, we have the following rule: Divide the pitch to be cut by the pitch of the feed screw and the product will be the proportional number; then multiply the number of teeth of the spindle gear by the number of teeth of the smallest gear of the compounded pair and the product by the proportional number and divide the last product by the number of teeth in the largest wheel of the compounded pair, and the product is the number of teeth for the wheel of the feed screw.

Suppose, for example, the spindle gear contains 16 teeth, running into the largest of the compounded gears containing 104 teeth and that the small gear of the

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compounded pair contains 52 teeth, what wheel will be required for the feed screw, its pitch being 8 and the thread to be cut being 32?

Pitch required		Pitch of feed screw		Proportional number
32	÷	8	=	4

Then:

Spindle gear		Small compound gear		Proportional number		Large compound gear
16	×	52	×	4	÷	104

equals number of teeth required for gear for feed screws

32

In the above example, however, all the necessary wheels except one are given and since it is often required to find the necessary size of two of the wheels, the following rule may be used:

Divide the number of threads you wish to cut by the pitch of the feed screw and multiply the quotient by the number of teeth in one of the driving wheels and the product by the number of teeth in the other of the driving wheels, then any divisor that leaves no remainder to the last product is the number of teeth for one of the wheels driven, and the quotient is the number of teeth for the other wheel driven. (In this rule, the term "wheel driven" means a wheel which has motion imparted to it while its teeth do not drive or revolve any other wheel, hence the large wheel of the compounded pair is one of the wheels driven, while the wheel on the feed screw is the other of the wheels driven.)

Example: It is required to cut 40 threads to the inch, the pitch of the feed screw being 8, one of the drive wheels containing 52 teeth and the other 16. Thread required to be cut 40. Divide by pitch of feed screw, 8, multiply by teeth in one driving wheel, 52, multiply by teeth in other driving wheel, 16, equals 4,160. Then 4,160÷40=104 and hence one of the gears will require 40 and the other 104 teeth. If there are no wheels on the lathe, we proceed as follows: Divide the thread required by the pitch of the feed screw, the quotient is the proportion between the revolutions of the first driving gear and the feed screw gear.

Example: Required gears to cut 40 threads, the pitch of feed screw being 8. Here 40÷ 8=5, that is to say, the feed screw must revolve five times as slowly as the first driving gear. We now find two numbers which, multiplied together, make five, as $2 \times 2\frac{1}{2}=5$, hence one pair of wheels in this case must be geared 2-to-1, and the other pair $2\frac{1}{2}$-to-1, the small gear of each pair being used as drivers, because the thread required is finer than the feed screw.

Can't always satisfy timer

M. M.: Where I am employed we have a timing machine and the boss insists that all our work must pass the machine's test showing nice, clean lines and that three-position test must be alike. With the many inexpensive watches on the market today it takes a lot of time and effort to satisfy his expectations, and it is almost impossible to make a fair week's wages. Do you consider it fair on his part to exact such work from the watch repair department?

Answer: Generally speaking, I would assume that your employer is not an experienced watchmaker and does not realize what skill and experience is required to cause a watch to satisfy the timing machine. I agree with him that a high grade or R. R. watch must show a clean record in all positions and to keep very close time. The watch was built and paid for to perform satisfactorily and within a given tolerance. However, an inferior grade watch was not built or sold to keep perfect time. It looks as though your employer was sold on the timing machine by some salesman who claimed all watches must show clean lines or they are not in order.

We all know that there is a great difference in finish and adjustments between the high priced and low priced watch, so how can anyone say that the low priced watch must keep the same good time as the high priced watch. Suggest to your employer to test his stock watches and he will soon

find that very few of his stock watches come up to his expectations. He bought different priced watches and he will find he has a stock of watches that will show assorted records. According to the grade watch tested you will find that many watches will give ratings that are somewhat irregular, but when carried will give fairly good time. When carried, these errors will counteract one another and the average error will not be of serious consequence for the cheaper grade watch. I do not want to give a fixed tolerance for these watches, but suggest you use your own good judgment about how close the rate of the $25.00 watch should compare with a $100.00 watch. We surely cannot expect the same results from both watches.

Lift and draw adjustment

G. B.: There are a few things that are not exactly clear to me concerning the escapement action, mainly as follows:

(1) Which is the most necessary for increasing the balance wheel motion—"correct draw" or "correct lift"?

(2) When testing for "proper draw" by moving the pallet away from the banking pin slightly and seeing if it will return to the banking pin with some degree of power, what should be done if the pallet does not return to the banking pin in this test? In other words, what is to be done if the "draw power" is not sufficient to snap the pallet back against the banking pin when testing for proper draw? I am referring especially to stones that are fitted into the slots "press fit" with no side play whatsoever and assuming, of course, that the watch is otherwise mechanically o.k. Thank you for your consideration in clearing up these escapement questions.

Answer: It is to be understood that both these conditions must be correct in order to obtain proper balance motion and if either one of these adjustments is at fault, it will reflect on the balance motion and to say which fault is worse and most damaging to balance motion can only be determined by actual tests. However, before making any changes as to slide or draw, it might be well to examine the escape wheel teeth. You may find that the front of tooth shows wear or a flat surface that is creating surface friction on locking face of pallet

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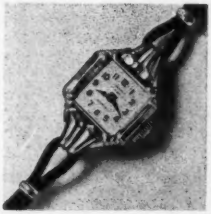

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stone. A flat surface on escape wheel tooth would also create oil adhesion to prevent proper draw.

If either of these suggestions is not the cause, then perhaps it would be well to tip the pallets stone by grinding the slots in the pallet frame to widen them slightly to allow repositioning the pallets. The slight change in lift angle to pallet will not affect the balance motion nearly as much as no draw will have interference with the free motion of the balance wheel. It can be possible that this trouble existed when the watch left the manufacturer, so perhaps it would be cheapest in the long run to return the watch to them where, I am sure, they will make proper adjustment or replace new parts.

Take it easy on watch

H. G. W.: A friend of mine bought a Mido Multifort 240° automatic at a stock clearance sale of a jewelry store in which they marked down a lot of older stock. A month or two later it started keeping erratic time, gaining a little one day and losing a little the next, so he brought it in for me to check. On taking it down, I found all the jewels were dry, so I cleaned it carefully and checked every part carefully and reassembled it. I wore it around the bench for a week and it kept perfect time; however, after giving it back to him, he says every time he does any strenuous work involving a lot of arm action, it gains two or three minutes an hour. I've rechecked it and everything seems to check out o.k., but still the same results. Possibly you might be able to tell me where my trouble lies.

Answer: From your explanation about this watch that when you wear the watch it keeps time, but when your friend wears the watch doing strenuous work it gains time, we might deduce that any watch subjected to strenuous work is very apt to gain time as the continuous interference of balance motion causes it to bank and naturally to gain time. However, it is possible that the present mainspring is a trifle too strong causing excessive balance motion and consequently every jar will increase the balance motion to bank and gain time. If you find this condition, replace with a weaker mainspring.

Naturally, a watch will stand a limited amount of abuse and your friend is expecting too much from this or any watch. Advise him to carry a pocket watch when he has strenuous work to do and wear his wrist watch after working hours.

Shaping an overcoil

D. P.: Will you explain how to shape the overcoil hairspring?

Answer: The double bend or overcoil can be done with a pair of tweezers. Grip the hairspring at the point where the rise is to start, then with the other tweezer give a slight upward twist thus bending the first part. Then grip the spring at the height you are to have the overcoil, bringing down level and parallel with the body of the spring proper. After that, you can shape the overcoil to the radius of the regulator pins and center the collet directly over the balance hole jewel. By means of altering the shape of the overcoil, but not changing the form that passes through the regulator pins, that part of the spring must at all times be concentric with the sweep of the regulator pins.

Another way to shape the overcoil or rise is to grip the hairspring at a place where the rise starts and holding a firm grip to the spring, press the points of the tweezers into a piece of soft pine wood. You will find it quite easy and quick to get the rise this way, and naturally to bring the overcoil down parallel, just repeat the operation. With a few trials on your part, you will soon acquire the knack and from there on you won't have any trouble shaping the overcoil. Practice on some larger springs first.

Tightening a barrel cover

M. C.: Will you give me a few methods to tighten a barrel cover?

Answer: One method is to use a barrel contracter. This tool is a metal plate with graduated hole sizes that are slightly tapered into which the open side of the barrel is laid. A large flat face punch plate is laid on, then a few strokes of the hammer on the punch will drive the barrel into the tapered hole thus closing or making the barrel smaller. (The large face punches accompany the plate.)

Another way is to place the barrel into a wheel chuck and as the lathe revolves apply a polished burnisher to the edge of the barrel, burnishing the snap edge inwards thus making the opening smaller to fit the cover. Still another way is to lay the barrel cover on a flat surface with the underside of the cover up, then with a smooth round face hammer tap the edge evenly all around the edge of the cover. This method is not particularly recommended, but with care a successful job can be accomplished. Laying the cover upside down is important—the most stretching occurs on the edge that snaps into the barrel.

Master and slave clocks

A. C.: What is meant by a secondary clock? Is it a clock that indicates seconds?

Answer: A secondary clock is one that is controlled by means of a master clock. The secondary or slave clock is constructed with a regular dial train, a cannon pinion, minute wheel and pinion, and the hour wheel. However, there is also some mechanical part that drives the dial train. This additional attachment is electrically controlled so that when the master clock sends out an electrical impulse all the secondary or slave clocks will be activated, thus advancing the hands to show correct time.

Some of these clocks are advanced each second, some each 30 seconds, and there are some that are advanced each minute. A master clock can control almost any number of secondary clocks and you will find that most of our modern government buildings are equipped with a master clock sending time impulses to all the clocks in the various offices. The master clock itself in some instances is controlled by the master clock or time signals from the Arlington Observatory.

Reverse power vibration

A letter from Virgil M. Hathcock, Monte Vista, Colorado, offers the following information:

I would like to offer my version of the answer to the question in the November

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issue by E. L. McR. concerning why the lever vibrates rapidly back and forth from a slight pressure applied to the center wheel.

I believe he is reversing the power to the train when he sees this fast action because that is when this most readily occurs. The reason why it happens is because of the angle of draw in the escapement. When the escape wheel is reversed it contacts the back sides of the pallet stones which acts as an impulse angle and the pallet stones are forced to retreat from the escape wheel teeth as they alternately come in contact with them. To get this action started it sometimes requires applying alternate pressure on the center wheel, but nearly any jeweled lever can be made to do this even though everything is correct with the escapement.

Drilling black onyx

S. W.: I am working up a piece of black onyx for a brooch. I want to drill a large hole in the center of the stone so that I can insert a piece of green onyx. My drills don't seem to be hard enough to do the job. Is there any other way that I can get a hole through the onyx?

Answer: Procure a piece of copper tubing of the desired diameter of the hole to be drilled. Mount in lathe and charge the copper tube with some sharp abrasive powder, such as fine carborundum, and water. The edge of the copper tube will become embedded with grains of carborundum and cut a core out of the onyx leaving a hole. For convenience in holding the onyx it may be cemented to some flat stick of wood where it can be easily held in position against the last stock spindle and while applying pressure to the spindle when performing the drilling operation.

Regulator pendulum

D. S. D.: I am building a regulator for my shop and would appreciate your advice as to which would make the best pendulum for compensation—mercurial ball, grid iron, or zinc combination?

Answer: The mercurial ball is usually considered the best. However, today the invar rod with a small brass bob has proven very satisfactory and much simpler to build.

Regulator screw rate change

A. C.: Can you tell us how much change in rate one turn of the regulator screw will have, such as we find on the whiplash regulator?

Answer: Much depends on the pitch of the thread and the freedom of the hairspring between the regulator pins. Assuring that this condition is right, the average change in rate for one full turn of the regulator screw will be about 15 seconds per 24 hours. If the pins are too wide apart, you cannot regulate your watch with any degree of accuracy. If they are too close or tight they will grip the hairspring and it will take some time for the changes of the regulator to become apparent on the dial, as the hairspring must work itself loose between the pins. It might be several days in changing its length. The regulator pins must hold the hairspring close and yet not cramp. If you expect to get proper response when changing the regulator screw, then the merest touch of regulator screw will affect the rate in seconds per day.

One-inch watch movement

A. B. C.: I ran across an old powder case that originally had either a compass or timepiece inserted in the round opening. It is exactly one inch in diameter. Can you advise me where I might find a watch movement to fit this opening?

Answer: You do not state whether this opening for the movement is constructed so that the movement can be swung open to wind and set the watch. It is most likely that the opening originally contained a compass which might be a fitting part of a powder case or horn. However, if the opening is so constructed to take a watch movement, you will find that a 6/0 American movement is exactly one inch in diameter. There are no Swiss watches made of that exact size.

Balance wheel composition

K. C. P.: Can you tell through your Information Please what kind of metal is used in balance wheels that is not affected by changes in temperature?

Answer: The metal used in our modern balance wheels and hairsprings is kept

secret as the many watch manufacturers have their own secret alloys and all claims are about the same that their watches are non-magnetic, non-rust and not affected by temperature changes and the coefficient of expansion is practically nil. Some of the compositions are made up of iron and nickel, some are copper and beryllium, and several other combinations.

Staff cut by jewel

A letter from Ole P. Olson, Route 1, Kalispell, Montana, offers the following suggestions:

Have had the same experience as P. B. P. in the December issue of A. H. & J. in regard to Incabloc jewels cutting staffs. At times this is caused by oil getting dry. I have restaffed some jobs and cleaned the jewels without further trouble. On other jobs, I have had to replace the jewel as staff has cut off several times until jewel was replaced without further trouble.

In regard to removing backs on pocket watch cases where the case screw has worked loose and is binding on cover, I use sealing wax on a board and cement back to it. Heat cement and back of watch for good contact, then wait until cement is almost cool but not cold; put board in vise and use pipe wrench on outside of watch. This will get any cover off. It will break screw and scar inside of case, but no further harm.

Balance pivot wear

Dear Mr. Samelius:

With reference to your column of Information Please in the December issue of A. H. & J., there was a letter from a Mr. P. B. P. in regard to balance pivots wearing off. I have had the same trouble on several makes of Incabloc watches. I think you will find the trouble with these watches is that when the watch came out new there were small metal particles in the case or in the works itself; in other words, it would be practically the same as metal dust. If you will notice this happens on new watches. I have never had any trouble with the same watches that have been cleaned.

I don't think Mr. P. B. P.'s problem is in

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bad Incabloc jewels because I have found very few were not in good shape where the balance staff was worn out. I think you will notice this wear is worse on an Incabloc jewel movement than it is on a stationary jewel movement due to the fact that when you bump your watch, your cap jewel will raise up enough to let these metal particles collect on your balance pivots.

This is my own personal experience; maybe someone else has a better explanation. Any comments from any of you fellows? Let's hear from you.

W. A. Goss

Avoid roughing barrel arbors

T. F. C. offers the following suggestion: He claims that he has found the same trouble in several watches and that passing the word might be helpful to some of our readers. He says that in his part of the country there is an unknown watchmaker who, when inserting the barrel arbor in place, uses a cutting plier to grip the arbor leaving plier marks on the bearing surfaces. These marks interfere with the free motion of the barrel, causing loss of power and cutting down the balance motion to the point that the timekeeping qualities of any watch are very much impaired. He says that unless the barrel is free to revolve, and the mainspring free to expand so as to deliver constant power, we cannot expect to get constant time from any watch regardless of its quality. So beware of rough barrel arbors—use brass lined pliers when inserting the barrel arbor. (How right he is!)

Appleton data

Dear Mr. Samelius:

With reference to the inquiry marked R. P. in the November issue of A. H. & J., the following information may be of interest to your readers.

Between the years 1829 and 1852, Henry Appleton submitted chronometers for the annual trials of chronometers held at the Royal Observatory, Greenwich, and more than a dozen were purchased for Admiralty navagational use.

The last chronometer purchased in this way was No. 609 which was bought at the conclusion of the 1852 trial. It is reasonable to assume, therefore, that the chronometer No. 607 was made about the same date for a private customer as it does not appear in our records.

I think there is little doubt that Henry Appleton was actively engaged in the chronometer trade in Clerkenwell, finishing and adjusting the chronometers bearing his name.

Britten in his book, "Old Clocks and Watches and Their Makers," writes: "Henry Appleton was in business at 50 Myddelton Square, London, from 1840-42 and was subsequently in partnership with Birchall in Southampton Row."

GEORGE RICKETT, *Officer-in-Charge, Chronometer Dept., Royal Greenwich Observatory, Herstmonceux Castle, Hailsham, Sussex.*

License and examination

E. B.: In acknowledgment of your recent inquiry concerning the subject of licenses, please consult your local city government for information and conditions relating to a shop owner's license. You will find that nearly every city requires such a license. Watchmakers must be registered in the following states: Wisconsin, Minnesota, Iowa, Indiana, Oregon and Louisiana. In these states, licenses to operate are issued by the State Board of Examiners in Watchmaking after the applicant has successfully passed an examination.

Bright-cutting aluminum

B. S.: How can I bright cut aluminum?

Answer: For turning or engraving aluminum, you will find that keeping the points of cutting or turning tools moist with turpentine will aid and give good results.

Mrs. Samelius and myself wish to thank our many friends for the number of Christmas greeting cards and are wishing our many friends and readers a very prosperous and happy New Year. —W. H. S.

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By J. E. COLEMAN

Count on Material Men for Help

Mr. Coleman invites your questions. If your question requires a direct answer, please enclose a self-addressed, stamped envelope. It is impossible through correspondence to give valuations of antique time-pieces; questions of this nature cannot be answered accurately.

THERE IS A VERY REAL condition existent and one cannot contact jobbers and material dealers without being aware of it. Whether or not the bench mechanic knows it, has forgotten it, or just plain ignores it, is beside the point—without a single exception everyone of them is willing and anxious to help the bench mechanic with his problems.

I sometimes wonder if the horological repair trade is not beset by an ill suffered by none of the other repair services, even though the bench mechanic may be located in the shop with other workmen, both activity and association are restricted by the type of work. The smallness, the skill and the extreme concentration required automatically narrows his world down to about one square foot of space right in the center of his bench. Hang this atmosphere about his neck day in and day out, year after year and if he doesn't watch out, he will find himself almost living in a little world of one square foot.

I'm no "couch doctor," but I feel that perhaps this may be a large factor preventing him from taking many problems to his material dealer, or even actively participating in trade organization work. If you have a problem, individual or general, drop him a line, or phone him. Maybe you need a tool for a particular operation, maybe you have devised a tool and would like to get it on the market; whatever it may be, I'll assure you of patient cooperation.

Don't misunderstand me. I'm in no position to speak authoritatively for jobbers and material dealers, but I know them and they are the most patient and long-suffering group of people on the Lord's "footstool." Any man who can stand behind the counter and listen to a tale of woe that a stem does not fit because of too many threads holding the crown above the case, then smile and correct it, is bound to be one of the "elect."

The fellow who can go seriously about filling an order that reads, "Send me a verge," without blowing his top, certainly has something I haven't got. So, also, has the man who will take back a staff after it has been staked in and then driven out only because the pivots fit a little tight in the jewels. Maybe you feel that I've strayed from the indicated path, but this is *Otherwise,* and let me remind you that cooperation has been the theme of our remarks for years and the material dealers and jobbers do cooperate—God bless 'em.

Spare new 400-day springs not good practice

■ THE "GIMMICK" of enclosing a spare suspension spring with each new 400-day clock is not elevating them in the estimation of the repairman, and neither is it resulting in any special benefit to the purchaser. Why not throw in an additional glass dome? They are just about as fragile.

In the first place, many of the better repairmen refuse to use them because they prefer the Horolovar over and above those of bronze or other metals. Many are acutely aware of the psychological angle

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entering any job where the owner is permitted to supply the material since said customer invariably tries to use it as a hammer to beat the price down. The actual cost of the paint in a fine portrait (oil painting) worth $750.00 to $1,000.00 probably doesn't cost over $5.00 or $6.00, yet it is exceedingly hard to disassociate the cost of material and cost of skill in the eyes of John Q. Public.

We've observed that it also creates a peculiar situation that could not exist if that extra or spare spring was not furnished. Many shops and/or repairmen seem prone to "pick" for short and easy jobs. Some that won't even take in a 400-day clock for major repairs or an overhaul seem eager to grab one when the owner holds forth the spare spring. They will promise the job in 30 minutes or an hour and do it for a buck or a buck-fifty.

On its face this might indicate that the spare has actually gotten the owner both a quick and cheaper job, but actually it is a rare case where the end result is just that. We've had a number of stories where these "quickie" repairmen use every dodge in the book. One said, "We don't repair those," and when the owner reminded him that he had inserted a spare a couple of weeks before, replied, "Well, you had the spring and we just pinned it in to accommodate you." Another said, "Lady, we can't be responsible for the performance of your clock—we just put in the spring you had."

And here is the grand-daddy of them all, "How could you expect us to guarantee your spring?"

Just as John Q. will not separate in his thinking that the cost of material does not necessarily limit the time and skill required for a satisfactory job, he does not separate a job and a guarantee thereon. As we have said before, the 400-day will not time up like a Hope-Jones free pendulum, or like a Riefler, or even an Atmos, to get more in its mechanical class (torsion pendulum). Any clockmaker worthy of the name can make them perform in a manner satisfactory to the average owner. If you are not striving to build your business on satisfied customers, you'd better quit right now for you can never do it any other way.

Handy tools coming up for repairmen

■ WILLIAM A. PHELPS, 4106½ Glenway Avenue, Cincinnati 5, Ohio, writes that he has had enough of trouble getting screws into difficult and far-away places, so decided to do something about it. The result is that he is now offering a splendid screwdriver with an 8-inch blade, plastic handle, that has a practical and ingenious method of holding the screw to the blade. Set the blade in the screw slot and just press the handle forward. It grips, enabling one to set the screw in the hole. Price $1.95, plus 15c postage.

He also tackled the chime rod problem and is marketing a chime rod 11½ inches long by 3/32-inch diameter, fitted with threaded and slotted brass boss. All you have to do is to drill out the broken rod, tap the hole and screw his rod in, tune by cutting to length. Price $1.50 each rod.

His letter closed by saying that there is more to come and he hopes to shortly announce a hairspring vibrator for clocks, a clock depthing tool and assorted mainspring clamps. Something to look forward to.

Future developments in the trade

■ NICE CHAT via long distance telephone with P. F. Laks (M. J. Lampert & Sons, New York City), a good letter from James Swartchild (Swartchild & Company, Chicago), another from Max Lazarus (L. & R. Manufacturing Company, Arlington, New Jersey), another from Joseph Dean (Dean Company, Daytona Beach, Florida). Of course we've chatted with Bill Parker (Young-Neal Company, Nashville, Tennessee) and gabbed with every traveling salesman convenient, plus many letters from over the entire U. S. 1955 bids fair to be a year of activity in the clock repair

field, but as of the moment, no one has anything new for this *Otherwise*.

Mr. Swartchild did point out that at the beginning of this year they are marketing an improved crystal cement called "Airtite" which they have had for many years and lately in the applicator tube. It was originally designed for glass crystals and the new "Airtite," under their number 55100, has been improved for a better use with the modern unbreakables of lucite and the rock type.

Sometime in 1955 L&R will bring out a new industrial type cleaning machine that will work especially well with large clocks. Mr. Lazarus says it's on the drawing board and for me to keep still—he will flash the word at the proper time.

A splendid letter from friend C. G. Smith, 307 Madison Street, N. W., Washington 11, D. C. He tells us that he is now ready to market a pivot polishing compound he developed about 12 years ago—"PiPoCo"—$1.00 per box including postage, ordered directly from him. We were sort of brought up on diamantine, but find this to be an excellent compound and there is nothing left to be desired from the polish obtained with it. Best results are had by using a very small amount on your boxwood lap. We like it very much.

Got troubles with mainsprings for the little Swiss alarms and traveling clocks? Fred Mosier of Henry Paulson & Company, 131 South Wabash Avenue, Chicago 3, Illinois, says they have the answer. It is a special little cabinet with a handy reference chart showing interchangeability and containing 24 most popular numbers for $7.90—their No. 185.

Judging from our mail this month, it seems that Clark Seymour and *C. & O.* were about the only two spots in the country without knowledge of the correct address of the Standard Electric Time Company, 35 Logan Street, Springfield, Massachusetts. We asked in the December column, and W. C. Chandler, in charge of their repair department, writes:

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Dear Mr. Coleman:

Enclosed is a folder on the Standard Electric Time Company clocks. Wonder how you missed having anything in your files—the company has been in business for 20 years. I read your C. & O. regularly.

W. C. CHANDLER

When we wrote Mr. Chandler thanking him for the folder for our files, we were almost tempted to apologize for not having already gotten one, but when we thought of how hard we've worked to build up a file, how long and consistently we have pleaded for cooperation, there came doubts that any apology was in order.

Charles Dennie, Gloversville, New York, writes giving the Massachusetts address of the Standard Electric Time Company, and suggests that the Standard Electric Time Company, 200 Deleward Avenue, Buffalo 2, New York, would be closer to Mr. Seymour.

As we prepared to mail this there came an announcement of two books. Thus we are faced with the question of whether to wait 30 or 60 days for the full scale review (which the column never does without completely reading the book), or making mention now as dictated by the desire to get news while it's new. So, without time for a check with our Book Department, we risk that mention.

F. J. Britten's "Watch and Clockmakers' Handbook, Dictionary and Guide," revised by J. W. Player, 544 pages, 500 illustrations, $12.50, and Britten's "Old Clocks and Watches," revised by G. H. Baillie, C. Clutton and C. A. Ilbert, 500 pages, 183 plates, 40 figures, $17.50.

This is the seventh edition of this splendid work, and the revision was in capable hands. Brooks Palmer told us of this revision, etc., back while the work was in progress and, comes the next issue, we shall have all the details and I'm sure that the Book Department will by the time these lines reach our readers.

We can't write thirty to this *Otherwise* without a word of praise for the staff at G.H.Q. How do you like the "forward" look? We like everything about it—it makes a real snappy appearance. George Martin and Virginia Clough call it the "new look," but I don't like that term for it reminds me of this Dior fellow from Paris, and I don't hold with his views at all. It is a distinct, forward step in trade publication layout and, further, it is a reminder that Publisher Hagans is ever alert to keep A. H. & J. out front in the field.

J. & J.

Dismantling a cuckoo

Dear Mr. Coleman:

Since your column first appeared seven years ago, I have been intending to write, letting you know what a help your efforts have been. So a belated Happy Birthday! Now I can procrastinate no longer, as I need your advice.

From time to time many readers have expressed a desire that you write a book on clocks. Here is another. I believe at one time you sent out a feeler to ascertain what the "amateur" would like in such a publication. Also, you wondered just how the term would apply.

Personally, I believe "novice," "beginner" or "hobbyist" would be fitting. After reading the questions asked you every month, I have come to the conclusion that many of them are not sent in by experienced horologists, but by enthusiasts like myself, with no one else to turn to. These fellows all love clocks, especially the ancient ones.

I am sending a sketch of the first cuckoo clock I have ever seen or owned, and I want to make no mistake in removing the wheels for cleaning. The front of the movement is a solid piece, and I do not believe the end pillars were intended to be removed, rather the two center stanchions. I hope the sketch is clear enough for you to see two eyelets at the top.

1. What tool would you suggest for removing these?

2. Could I make new ones with small, round-nosed pliers (They are also used on bellows, etc., and some are missing. As I

do not have round-nosed pliers, could I buy and use click-spring coiling pliers?)

3. Would you think the bottom of the stanchions is held by steel pins?

4. What is the purpose of the hook on top of the movement?

5. This last question I will probably determine for myself as I start work on the strike train, but do these clocks generally strike the hour on the gong and also the full number of counts on the pipes?

Thank you for your help, both present and past. I always will look forward each month to your column.

CHARLES W. YOUNG
5437 Old Ridge Road
Route 2
Erie, Pennsylvania

Dear Mr. Young:

Your remarks about the column are very much appreciated — don't wait another seven years to do it again. Yes, we've had in mind for several years to compile (not write) a volume on clock repairing, and have from time to time, put out "feelers" through the magazine as to what might be expected of such a tome. It is a tremendous task and goes forward very slowly.

It is quite easy when you are face-to-face with the fellow, know his background and what tools he has, and have the movement in your hands, to say, "This goes here" or "This is supposed to do such and such."

From every indication, such a volume must of absolute necessity contain many photos and drawings. To make either and come up with satisfactory results is time killing. Now to give you the unvarnished truth about the tome, it's kind of riding in the back seat, or should I say, just simmering on one of the back burners. The cold facts are that the No. 1 workday must be devoted to running a repair bench for the benefit of the grocer, the baker and candlestick maker (and the creditors—bless 'em) while the No. 2 day goes to the column, correspondence and research. Of course one's daily living has to fit into the picture somewhere. As you know, this is time-consuming, and thus the best one can hope for is a few moments here and there to arrange, check and double-check data, decide what should be included and what

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should be thrown out, what needs shortening, and what needs more length to make sure it's clear. Some of these days we'll pull it out onto a front burner and let 'er boil till she is done.

The cuckoo clock you have sketched happens to be a very old one, built in the style of the Swartswald clocks. Here are the answers to your questions:

No. 1. This is a little pin that holds the strip of back plate in the frame. Slip a round-nose plier in the eyelet and pull out.

No. 2. This type of little wire push-pin is used a lot. You can make them out of any good stiff wire of suitable size. Those that work in the bellows you mention may be made from paper clips.

No. 3. No. The bottoms of the plate-strips generally fit into little recesses cut into the wood floor of the frame. It would not hurt a thing to "pin" them as you suggest.

No. 4. The ceiling and floor of the frame extend behind the pendulum a half-inch or more in order that they might hang against the wall (or back of case) and permit the pendulum sufficient freedom to swing. This hook was to hang up the clock.

No. 5. You are correct. The cry of the cuckoo consists of two notes. This is followed by a stroke upon the wire gong for each hour the hands indicate. Thus he whistles and the hammer strikes the gong, six times for 6 o'clock, etc.

J. E. C.

History of Aurora Watch Co.

Dear Mr. Coleman:

I have a nice 18S Aurora watch and I would like to know the history of it. The only engraving is "Aurora Watch Company, Aurora, Illinois," safety pinion, 15-jewel, serial number 131501.

The case was made by the Dueber Watch Case Manufacturing Company; 14k special gold-filled case. I would appreciate all the information you could give me.

DON OLSON

4024 Pacific Way
Longview, Washington

Dear Mr. Olson:

The Aurora Watch Company, Inc., Aurora, Illinois, 1883, began making watches in 1885, but failed a year or so later and the machinery was sold to the Hamilton Watch Company in 1892. We note that the serial number of your movement is 131501 and regret that we cannot give you the exact code which was used. I'm pretty sure the company never produced that many pieces, since their maximum production is generally conceded to have been about 100 a day. Check right under the balance cock for another number. This is said to be the true number.

Charles S. Crossman (1856-1930) began a series of articles in the summer of 1886 in one of the trade journals under the title of, "A Complete History of Watch and Clockmaking in the U. S.," and we quote here his article on the Aurora factory: "The conception of the Aurora Watch Company seems to have been with Mr. Wendell of the firm of Charles Wendell and Sons, doing business on State Street, Chicago. The organization of the company took place July, 1883, with a nominal capital of $250,000.00 in shares of $100.00 each payable in small monthly installments. The scheme was to interest one dealer in each town or city to the extent of making him a stockholder in the company and in turn give him the exclusive agency for the sale of the company's movements in his town or city.

"This appeared very plausible, for if enough dealers could be interested in the scheme, the company would have a guaranteed outlet for its production. The officers were Messrs. E. W. Trask of Aurora, president; Albert H. Pike of Kankakee, vice-president; Maurice Wendell of Quincy, treasurer and business manager. The directors were Messrs. M. Huffman of Quincy, E. W. Trask, Maurice Wendell, George F. Johnson and A. H. Pike. The scheme appeared auspicious and a considerable amount of stock was subscribed for in a short time.

"The city gave the company a plot of ground located in the southern part on which ground was broken immediately for a factory building. The machine shop was completed and occupied in September fol-

lowing when work was commenced on tools by a few men under Mr. Johnson as superintendent. The main building was commenced on September 1, 1883, and finished and occupied February 1, 1884. It was three stories and basement and is well suited for the purpose for which it is built.

"George F. Johnson, who is a practical man and one of the directors of the company, was appointed superintendent and commenced making parts of watches as soon as they were located in their factory. The movement is a regular 18S, full plate, of several grades in both nickel and gilt. They have a patent stem winding attachment made by Mr. Johnson. The first movements were put on the market in the fall of 1884 and were readily purchased by the stockholder dealers.

"Mr. Wendell afterwards severed his connection with the company and they then adopted the policy of selling their goods in open market, which plan if we may be allowed to pass an opinion, has made the company far more of a success than it would have been under the old plan. The company has usually employed 200 operatives, turning out about 150 watches per day. The greater part of them are low and medium priced grades.

"The officers of the company have changed somewhat, but for the most part remain the same as when first organized. They are at present as follows: Mr. Huffman, president; A. Somarindyck, treasurer; E. W. Trask, secretary; J. H. Webber, general manager; George F. Johnson, superintendent. They are all, with the exception of Mr. Johnson (who is a mechanical man), solid businessmen and all reside in Aurora, except Mr. Huffman, who is a leading jeweler of Quincy, and the success of the company may be said to be an assured fact."

This rosy outlook did not last very long, for I find in the American Jeweler for April, 1886: "At a meeting of the directors of the watch factory (Aurora) lately, it was decided to lay off all hands except those in the finishing department. This department is behind the others in their work and it is expected that this will even up the work. Business stagnation,

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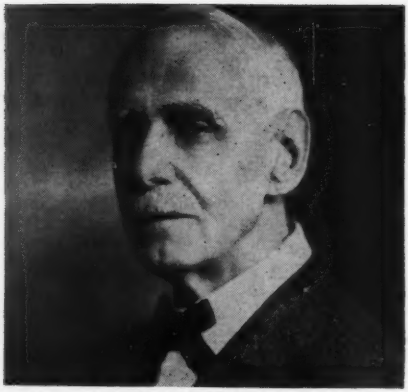

George F. Johnson (Aurora)

caused by numerous strikes, has not tended to help the business of the company for several weeks past."

In the September issue we see a line stating: "The Aurora Watch factory now employs about 90 hands." Again we find Aurora mentioned in the April, 1889, issue: "There are 310 on the payroll of the Aurora factory. Two years ago the Aurora factory was making 20 movements a day; now, the number is six times that."

George F. Johnson (born January 26, 1851, died March 16, 1931) mentioned in the Crossman article as the mechanical man (and superintendent) had worked at the Rockford Watch Company before going with Aurora. After Aurora, he was a timepiece manufacturer (Waltham was first) in the U. S. for determining correct time and was the first to broadcast time by wireless for a watch factory.

He designed and built the telescope in the Illinois shops as well as supervising much of the electrical work in connection with the establishing of their broadcasting station—it was "9ZS." He was well known in most scientific circles, author of a number of articles and will be the subject of one of our "Stray Bits" articles toward the latter part of 1955.

J. E. C.

How Sangamo winding works

Dear Mr. Coleman:

I have been reading other people's problems in your column, now I'll ask one. I have a Hamilton Sangamo clock to repair. It is an electric clock that will run on electricity and at the same time wind a spring which will run the clock if the current should go off. I am not the first person to get this clock to repair. The owner tells me that the other repairmen told him that there is something missing, but they didn't know what. I have never seen one of these clocks before, so my question is: Do you have any information that you can give me?

I wrote a letter to the Hamilton Watch Company in Lancaster, Pennsylvania, and they wrote me a letter telling me that they sold all rights to the Seth Thomas Clock Company of Thomaston, Connecticut. They also said the Seth Thomas Clock Company advised them that this clock is now obsolete and there are no more parts available.

The trouble is in the winding. It doesn't stop winding the spring. I will appreciate any information that you can send me.

AMBROSE H. BARD

34 East Orange Street
Lititz, Pennsylvania

Dear Mr. Bard:

The sale of the Sangamo Hamilton clock to General Time Instruments Corporation was in 1930 and parts have not been available for about 20 years. These clocks were generally equipped with an Illinois 7-jewel watch escapement, which escapement was driven by a regular mainspring. This spring was wound by an electric motor.

Many repairmen encountered trouble with the winding, yet that winding was sound mechanically and fairly simple if only the repairman would take the time to study it out. It is noted that your clock does not stop winding. Either the brake isn't correctly set, or some former repairman has lost the little single ball end bearing under the wheel brake. More than likely, it is both.

First, you will observe that the motor winds the spring by turning the arbor.

Fitted into this arbor is a threaded collar. Now when correctly set up with the spring all the way down, this threaded collar is out or farthest from the barrel proper. There is a lever pivoted to the plate, which lever ends in a "Y" or fork that rests right under the flange of this threaded collar, also on this lever, back nearer the pivot point is a leather-faced shoe riding just above one of the wheels of the motor winding train which I called the brake wheel above.

As the motor turns the arbor to wind the spring up, the turning of the arbor at the same operation screws in on the threaded collar and this collar pulls the pivoted lever down bringing the leather shoe against the brake wheel. The travel, in and out, of the threaded collar is calculated to equal the number of turns required to wind the spring fully, thus when all the way down (spring) the collar is farthest out and when fully wound up, it has been screwed down next to the barrel head.

You therefore adjust the leather brake shoe which is inserted into the lever by means of a threaded post so that when the collar is screwed almost completely in, the lever will press the shoe against the brake wheel hard enough to stop the motor. The clock running down reverses this procedure and as soon as the mainspring unwinds enough to release the pressure on the brake shoe, the motor takes over and commences winding.

Now observe the bearing under the brake wheel; it is capped with a metal cap. There belongs in this bearing just one very small ball. The end of the brake wheel arbor pivot works against this ball. Many repairmen not familiar with these clocks do not know of this construction, and pull the clock down losing this ball.

If the trade has any tricks, here is one of them. You may obtain a practical, workable ball from an old ball point pen. With the bearing under the brake wheel in proper order (the bearing on the opposite end of this pivot is just an ordinary hole bearing in the plate) and the threaded collar properly set with the brake shoe adjusted so as to exert enough pressure on the brake shoe to overcome the pull of the motor, just about the time the threaded collar reaches a couple of threads before

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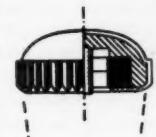

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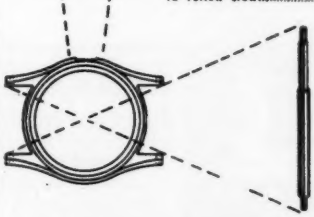

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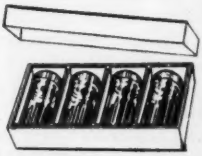

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the end you will find the winding is functioning as the manufacturer intended.

Remember, there are no switches—the current remains on the field coil at all times. The winding motor turns only when the pressure is released on the brake shoe. It is best to place the movement up in a movement holder, connect it and watch the operation. Most of these clocks are strikers and the same spring powers the strike through a differential gearing, thus when striking the spring goes down enough to allow the motor to wind some, it takes over.

It is easy to place on the minute hand and advance it one operation of the strike train at the time and see for a certainty that the winding operation starts and stops properly. Possibly we should cover another feature of the threaded collar in order to make its operation perfectly clear because the turning of the arbor turns or screws this collar in, yet the running of the piece does not turn the winding arbor in the opposite direction to screw it out There is a slot cut laterally with the collar and through the threading in which works a polished pin in a close-fitting hole in the flange. The actual mechanics are that when winding, the arbor turns the collar by means of this pin thus screwing the collar down and into the threading which is on the barrel proper.

When the winding operation ceases, the arbor sits still and holds the collar still by the same pin. It is the running (turning) of the barrel which screws the collar out. Make sure that this little pin has not been broken out, as the entire operation depends on it. This whole explanation has been rather long and somewhat involved. If it isn't clear, or you need pointers, please write again and detail the point in question. Sending me a rough sketch would help very much.

J. E. C.

Early U. S. clock resemblance

Dear Mr. Coleman:

I have been reading your Clockwise and Otherwise for quite some time and enjoy every one of them. I get quite a number of clocks in for repair and, needless to say, your articles and letters in answer to other fellows' problems are a source of valuable information.

I know that you are well up on the early clockmakers and having several old pieces in my possession, I would appreciate knowing a little more about some of the makers. Eli Terry, Eli Terry & Sons, Seth Thomas, Chauncey Jerome, Welsh, J. C. Brown, and Waterbury are among the most important. I would like to know if they had an association with each other, as some movements seem to be exact duplicates of others.

Did Seth Thomas and Terry work together or apprentice with one or the other? Was Chauncey Jerome associated with Thomas or Welch? I would appreciate hearing from you or seeing the answer in A. H. & J.

CLYDE R. FOGLE

58 First Avenue
Red Lion, Pennsylvania

Dear Mr. Fogle:

First, we should take the over-all picture; all of these gentlemen lived in what we of today would consider a small community. Besides being in the same line of endeavor, practically all of them were church-going men and a great many belonged to the same lodge, thus you can see that they were thrown pretty close together.

Eli Terry, Sr., Seth Thomas and Silas Hoadley were in a partnership at one time about 1809 at Greystone (now Plymouth), Connecticut. After something like a year or more, Mr. Terry withdrew, leaving the firm Thomas & Hoadley, until Mr. Thomas sold out to Hoadley about 1813. In the fall of 1816, Chauncey Jerome went to work for Eli Terry making clock cases.

Over and above such associations as mentioned above as a probable cause of clock movements looking alike, you must remember that there was much barter and trading in clock movements. For example, in his "History of the American Clock Business," Jerome writes that in 1821 he sold his home to Mr. Terry for "one hundred wood clock movements with dials, table glass and weights." Then he went over to Bristol to see George Mitchell

and bought from him a house with barn and 17 acres of land for 214 movements.

Mr. Jerome said, "I finished up the hundred parts which I got from Mr. Terry, exchanged cases with him for more, obtained some credit and in this way made out the quantity for Mitchell." Now here we have movements by Terry, cases by Jerome and I'm pretty sure that many, if not most, of those clocks bore the name of Mitchell. One might say a George Mitchell clock resembled the Terry movement when it is not a resemblance at all, but an actual Terry movement.

Mr. Elisha N. Welch first operated a foundry to cast clock weights before he purchased the entire J. C. Brown clock industry about 1850. One would naturally expect that Welch continued to make clocks with the Brown machinery and thus of a necessity turned out movements looking like those under the Brown label.

Re: your direct question. "Was Jerome associated with Thomas?" Insofar as I can determine, he never was. However, there is good reason for a resemblance between the Thomas and Jerome movements. I again quote from the Jerome history, page 103: "He (Thomas) sent his foreman over to Bristol where I was then carrying on business to get patterns of movements and cases and take all the advantage he could of my experience, labors and improvements.

"I allowed my foreman to spend more than two days with his, giving him all the knowledge and insight we could of the business, knowing what his object was." This was about 1840.

You mentioned Waterbury clocks and again I quote from Jerome: "The Benedict and Burnham Company, now making clocks in the city of Waterbury under the name of the Waterbury Clock Company, is composed of a large number of the finest citizens of that place. My brother, Noble Jerome, who is an excellent mechanic, and as good a brass clockmaker as can be found, is now making movements for this company."

This was about 1860, so you can readily see why some Waterbury movements resemble Chauncey Jerome movements—both were made by Noble. J. E. C.

Telechron unit repair

Dear Mr. Coleman:

I have been reading A.H.&J. for several years and have gained much knowledge thereby. Very often have been on the point of writing for information when I found the very next issue had what I needed, but this time I haven't found what I am looking for.

In the first place, can you give me the U.S.A. address of The Watchmakers of Switzerland? I want to get their new Norman Rockwell display, and their latest books.

Would like to comment on the repairs of Telechron units. It is true that it is not the best practice, but in an emergency I would say give it a try. I have a G.E. alarm with a Telechron unit that I repaired (unsoldered, washed with carbon tetrachloride, recoiled with pyrol) over six years ago, and it is still giving perfect service.

In this case I couldn't get a new unit and wanted to find out if it could be done. In a case where a new unit was unobtainable, I explained to the customer that it might not be too reliable. But as there was everything to gain and nothing to lose (the clock wasn't running anyway), I made a similar repair for which, of course, I made no charge as I couldn't give a guarantee, but the resulting advertising surely paid off. Later was able to get new units, and as far as I know that clock is still running, so I would say it depends on many things. Use your judgment.

Now I have two watches and a clock, all of which I have been able to repair despite the fact that I have been unable to find out where or by whom they were made. The clock is a small novelty affair with a sort of cylinder or drum escapement made by the Kleber Clock Company, U.S.A. No other address given.

One watch 10½ ligne, 10-jewel cylinder movement with the inscription "Remonloin Cylndre" engraved on the case—presumably Swiss. The other a 12 ligne, 17-jewel, pin-lever and auto-wind with the name "E. L. Stern & Son, Inc." stamped on the movement. I had to make several parts, and while it may be good practice, it certainly isn't very profitable.

Incidentally, can you tell me what "Ebauches S.A." stands for? Many thanks for any information you can give me.

E. J. CURRIER

175 Buena Vista
Auburn, California

Dear Mr. Currier:

Write Jean-Pierre Savary, The Watchmakers of Switzerland Information Center, Inc., 730 Fifth Avenue, New York 19, New York. De Carle gives the definition of "ebauche": "An unfinished movement, i.e. the movement in the rough before the escapement is fitted, or the train has been pivoted, etc." In Switzerland today there are ebauche factories making movements which comprise of plates, bridges, cocks, keyless work and the train. Other factories finish the movement, and fit the mainspring, pivot the train and jewel it, fit the escapement, the dial and hands and supply the case.

We are not too familiar with the use of "S.A."—we see it following some firm names, etc. Somewhere I got the idea indicates an association or confederation, and think that "Ebauches S.A." would mean something like "Parts Maker Association" or "Makers of Parts, Associated."

We do not locate a Kleber Clock Company, but do recall that Keebler Clock Company, 322 Chestnut Street, Philadelphia, Pennsylvania, marketed a line of novelty clocks similar to your description —check that spelling again.

E. L. Stern & Son Company, Inc., are located at 610 Fifth Avenue, New York 20, N.Y. Phone number CI-5-6930. Sorry, we do not locate anything on the little cylinder watch.

J. E. C.

Needs relief cutter

Dear Mr. Coleman:

I have been intending to write you for some time, but have not taken the time to do so. For the past few years, I have enjoyed your column very much.

In regard to your reply to Mr. F. R. Crawford in a previous issue of A.H.&J., please be advised that Mr. Charles A. Kuhn is deceased. We wrote to him con-

cerning a clock depthing tool some time back; we received the necessary information and placed our order. We received a letter from his daughter saying that her father had passed on and there was no one taking care of the business. We are still in the market for a clock depthing tool and would appreciate any information you may have at a later date.

You reported a while back on one of the small Sears lathes and stated at that time that they had a six-inch size in a heavier duty lathe. Would like to advise we have owned one of these for several years, and although the alignment must be adjusted and checked with test bar occasionally, it has proved quite satisfactory. I have a milling attachment and divided head for this lathe and use it for cutting wheels or pinions. We have used mostly fly cutters for this and would like to make some of our own cycloid cutters. We would appreciate receiving information on the attachment for cutting the relief or clearance angle.

Having had about twelve years' experience as a tool and die maker, I make quite a bit of the equipment which we use. We did make one of the rotary drum watch testing machines shown in one of the late issues of this magazine. We made ours all from clear plastic and operate it with a Hansen electric clock motor. We are, at the present time, working on another type of testing machine to test the safety action against shock. Let me thank you for any help you can give me on this relief cutter.

HUGH P. ABREY

159 Hull Street
Coldwater, Michigan

Dear Mr. Abrey:

Please be assured that your kind remarks on our efforts are especially appreciated. There is a lasting pleasure in knowing that we have helped.

Re the clock depthing tool, we understand that one is being manufactured in Switzerland. Nothing very definite as yet, but we are endeavoring to get a line on it and an importer, etc. It is likely that such a tool will not be stocked due to the very small demand for it, but I see no reason why we can't have the correct information, then they should be had from your regular material house on special order and special import. To do it this way should not increase the price, but the delivery time would be extended.

The sketch for relieving hobbs and cutters sent in by Mr. Paul Blanchat has already been sent to Mr. Ole P. Olson, and as soon as he returns it, it will be forwarded to you. The column would be interested in learning more of the testing machine you mention and also about the new device to test safety action you are working on now.

J. E. C.

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Correcting faulty Revere strike

Dear Mr. Coleman:

Like many other watch repairmen who don't work on clocks very much, I need help. I have a Telechron motored Revere clock, Cincinnati, Ohio, model 161314, self adjusting, quarterly chime and strike. The chimes work O. K., but the strike does not work right. I am sending you a rough sketch of my trouble.

At two o'clock the clock strikes once. The rack does not fall accurately and the rack hook doesn't drop into the correct tooth. The hook drops into the first tooth at 10 'til 2. At two o'clock it's at the correct spot near the snail step, but it drops too soon in the first tooth and strikes once.

I lift the rack and it drops into the second tooth and works O. K. I set the hour snail and wheel one tooth clockwise. It works O. K. at two, then I have the same trouble at 12 when it strikes only 11. Other hours the strike works all right. Can you please tell me where the trouble is? The clock was in another clock repair shop, but the trouble never corrected, a few years back. The customer just didn't use the chime and strike.

Since I am in your department and have a little more space left, I have another question. Just how does one get the rotor wheel off the Sessions clock motor arbor (the rotor that has the eccentric pin on it found in Mastercrafters' airplane clocks and Sessions alarm) without bending it?

PETE M. KOVAC

735 Barnett Avenue
Kansas City 1, Kansas

Dear Mr. Kovac:

Your effort to advance the snail clockwise by one tooth of the hour wheel over the dividing wheel was indicated and a step in the right direction, but since by so doing it clipped the twelfth stroke off the 12, it is plain that the step was too big.

First, we think that your strike train is dropping the rack-arm a bit too early since you say at ten minutes before the hour. Make the strike train lock just a tiny bit deeper so that the dropping action takes place around five minutes to the hour, then there will be considerably less travel of the snail between the drop and the strike.

You may advance (or retard) the snail by smaller steps than one tooth of the hour-wheel by doing it between the dividing wheel and center (cannon) pinion instead of between the hour-wheel and the dividing wheel. After setting the strike train so that the drop takes place around five minutes to the hour, turn the hands to the twelve o'clock position; this allows the rack-arm to fall into the lowest (12) notch of the snail.

Slip both the hour-pipe and the dividing wheel forward 'til you can revolve the dividing wheel barely free of the center pinion and adjust the snail so that the tip of the rack-arm rests in the center of the low notch, press the hour-pipe and dividing wheel back into position, pin the dividing wheel washer and allow the clock to strike the 12. Advance the hands to one o'clock; the rack-arm should drop mid-way of the high or one o'clock notch.

J. E. C.

Duplicating a locking lever

Dear Mr. Coleman:

I have a problem on a clock, and I wonder if you can help me out. As a rule I don't take in clocks to repair, but this belongs to a friend of mine, so I would like to repair it and having read your column thought I would write you.

The clock is a Waltham mantel with striking parts; it has been repaired many times, but no one seems to be able to get the strike to work correctly. I wrote to the Waltham Clock Company and after three months they returned the part stating they couldn't send a new one because they were not making them any more. However, they were kind enough to send me a drawing of the part which needs replacing after being butchered so much.

Now I'm wondering if you would send the part to someone you know of, along with the drawing, and have them make a new part? Perhaps you have this part on hand yourself and if you have, I would appreciate it very much, but if you haven't, would you please send it on to someone you know will make it? They may return it C.O.D., or bill me.

The original part is so messed up that it is impossible to make the strike work correctly. I enjoy your column in the American Horologist & Jeweler, even though I repair so few clocks any more.

CHARLES ROWLEY

1615 Broadway
Oakland, California

Dear Mr. Rowley:

As per your second paragraph, we are forwarding the old locking lever together with the drawing to Theron O. Sowers, 210 South First Street, San Jose, California, and I am sure that you will hear directly from him within a day or two.

We appreciate your letter and especially your kind thoughts on the column. We never have any material or parts for sale, but will go all out to connect you with a source of supply as near to you as practical. I think it was very good of the Waltham company to supply the print since material is no longer available.

The chances are you may never have need for another locking lever like this one again, and they are even greater that should you need one five or ten years in the future that you would not have it on file. Therefore, I am going to be bold enough to suggest that you place it in our file. Here it will be available to anyone who should find himself in your position now as well as to yourself should that second need arise.

J. E. C.

Dutton wood clock

Dear Mr. Coleman:

I am a clock hobbyist—have 52 of them, and some are quite rare. I have repaired and serviced some pretty tough ones with the help and working knowledge I have gotten from your A.H. & J. publication. I have absorbed more about clocks from your writing than you can imagine, but now I have to ask you for some information so I won't waste the time on just writing.

I have an all wooden clock (working fine), but I can't find out anything about it, so I am trying you on this one. The label reads as follows: "Improved Clocks, David Dutton, Mont Vernon, N. Hampshire" (on the bottom label) "Kings Print, New Ipswitch, N. H. 1836." The clock stands 29" high, 15" wide, hand-painted dial (11"x11"), 2 iron weights, works look like apple wood, all in good shape, and case is veneer with mirror on bottom section.

I bought this in Vermont for $1.50. Did I get a bargain? Sometime I will send a picture and describe an Austrian clock I have—at least that is what I've been told it is, but it is very odd.

Keep up the good reading matter.

STANLEY H. MITCHENER

576 Grafton Street
Worcester 4, Massachusetts

Dear Mr. Mitchener:

Kind remarks about our feeble efforts are always appreciated—we make every

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reasonable effort to dig out any and all kinds of data, both historical and mechanical, on clocks.

It has been our understanding that David Dutton deviated from many clockmakers of his time by placing on his labels the date, thus it is interesting to note that yours is dated 1836.

David Dutton was born in 1792 and died in 1882. He was actively at work in the 1830's and 1840's, and toward the latter part of his career it was "David Dutton & Sons"—both firm's labels were from Mount Vernon, New Hampshire. Dutton wood clocks did not follow the Terry pattern in their mechanical make-up.

A photo of your Austrian clock would be most welcome. Will you include the pendulum's length, dial diameter and any other data convenient? This will aid in comparison with similar clocks, etc.

J. E. C.

Missing watch parts

Dear Mr. Coleman:

I have subscribed to the A. H. & J. for some time and read your column with great interest. I have some interest in antique watches and have 4 or 5, including a clock with wooden works (Chas. Stratton, Worcester, Massachusetts 1842):

1. One of the watches has a bell to ring out the time (is this a repeater?) and a single hand. Name is Millogg A. Wienn; no other information on the works or case. Works appear to be well made, fancy cock (?) and back plate. Silver case drilled full of holes like those used for pivots. Has a carrying case. Do you have an idea how old this is or other information?

2. The watch needs repair. One of the gears coupled to the hand is missing—also some kind of lever which actuates the striker from a step (?) cam, and balance shaft is bent or broken. Several months ago, I recall you recommended a repair man for antique watches. Would you please send me his name.

I would also appreciate information on one other watch, but do not go to any trouble. Name "H. Y. Tenkins, Cheapside," and marks such as those in the sketch I am sending you.

JOHN L. WAGNER
3112 Chatham Road
Endwell, New York

Dear Mr. Wagner:

We are unable to locate either Wienn or Tenkins. From your sketch, the date letter indicates 1845-6, the town mark London, the quality mark Sterling and the final stamp W. T. Under a crown is the maker's mark—practically the same as a trademark as we know it today.

Re: the missing wheel and lever, write to Carl Plepla, 522 Fifth Avenue, New York 18, N. Y. Get specific instructions from him as to packing, when and how to ship, etc.

J. E. C.

Seth Thomas 30-hour

Dear Mr. Coleman:

Would you supply me with the name and address of a shop or person that can re-leather cuckoo bellows? It seems that I have read of places mentioned in your column several times, but can't locate them now.

I am also sending you a rough sketch of the front plate of a Seth Thomas clock movement which a local party brought to me. They want to know how long a run this movement has. The springs are narrow and short, and the movement is rather small too.

I purchased a book (Watch Factories of America) some time ago, and in the front pages is your stamp. Just thought I would mention it in that you might be interested in knowing how widely something like this travels.

Best regards.

JAMES O. KNUDTSON
P. O. Box 471
Roseburg, Oregon

Dear Mr. Knudtson:

Your last paragraph re the book is very interesting. I recall quite well when, why and what I sold it for. That has been nearly 20 years ago and I'm wondering

what circuitous route it took to get to the west coast—I've always regretted that I let it go.

The little Seth Thomas clock you indicate is a thirty-hour (one-day) movement. I don't think we could find anyone now re-leathering cuckoo bellows—that was back when new bellows could not be had owing to the war, and the only recourse was repair. Today you can buy good bellows for as low as $1.99 per pair. I'm sending you page 56 of the Black Shield Watchman No. 448. Swartchild's nearest branch to you is 1318 Second Avenue, Seattle, Washington.

J. E. C.

Shelf and case movements

Dear Mr. Coleman:

I am needing some information so am making this request. I have a customer who wants a new set of clock works for a clock case he now owns. He wants a spring pendulum type movement that will have a very loud tick.

Can you give me the address of a reliable firm to which I may write for catalog showing different styles of movements, etc.? I am a watchmaker, but I enjoy reading your section of the A. H. & J. as very good information is found there for each and every one. Thanking you in advance for the information available and awaiting each new issue of the A. H. & J.

A. P. McINTYRE

2145 N. E. 26th
Oklahoma City 11, Oklahoma

Dear Mr. McIntyre:

You do not state whether your customer's case is a tall or shelf case. There are no shelf clock pendulum movements of American manufacture on today's market.

The Kuempel Chime Clock Company, 3611 Brunswick Avenue, Minneapolis 16, Minnesota; The A. C. Becken Company, 29 East Madison Street, Chicago, Illinois, and the Nessalc Company, 4 East 41st Street, New York 17, New York, can quote you on tall clock movements. Clock Manor, 1901 East Colfax Avenue, Denver 6, Colorado, can quote you on a shelf type movement.

J. E. C.

NEW 1954 ELIX REFORM SWISS BATTERY CLOCK MOVEMENT

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- POWERFUL: Operates hands up to 12" dial size.
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Twinface Clock Co.

Dear Mr. Coleman:

We are trying to obtain some material for a clock made by the Twinface Clock Company whose address was 295 Madison Avenue, New York, N. Y., but our letter was returned. Can you tell us if this company is still in business and, if so, give us the address, or, if you can tell us where we might obtain material for their clocks? Would appreciate any information you can give us.

C. A. DAYTON

2676 East Florence Avenue
Huntington Park, California

Dear Mr. Dayton:

The Twinface clock has not been manufactured since about 1944. Try Ernst Hucke, 210 West 82nd Street, New York, N. Y.—he was once servicing and supplying parts for these clocks. I am enclosing a self-addressed card. Will you let us know whether or not you get the necessary parts from this source?

J. E. C.

American clock books

Dear Mr. Coleman:

Do you have, or can you secure for us, a good book on American clocks? We want something that covers the history of American clocks, illustrated, from the beginning of the industry in the U. S. A. If Dreppard's is available I believe that is what I want, or perhaps Brooks Palmer's "Book of American Clocks," whichever one will best suit my purpose.

H. J. THOLEN.

Hays, Kansas

Dear Mr. Tholen:

Both the books you mention are excellent, and the A. H. &J. Book Department carries both in stock.

I presume that in addition to wanting the information for yourself, you may be planning on using it in connection with your repair trade. It is indeed an excellent advertisement for your shop to be able to pass along some facts to the owner of a clock you have just repaired.

The Dreppard work devotes more space to its general history section and less to its listing section. He is able to do this because his listings contain only dates opposite names and firms, whereas Mr. Palmer adds after the dates opposite listed names, various bits of historical data as well as any other connections that that name or firm might have had with the clock industry. We've just been advised (can't lay my hands on the letter now) that the price of the Palmer book has been reduced, in fact, I believe you can buy both books for a little less than this one formerly sold for, so why not order both of them?

J. E. C.

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Watchmakers' Contest

CORRECTING LOOSE ROLLER TABLE

CONTEST ENTRY #50

I find that many times after a watch has been repaired for years that the roller table becomes loose and will not hold tightly to the staff. By way of correcting this, I use fine steel wool. Just an inch long section of the finest steel wool doubled over and inserted in the hole of the table will, in most cases, provide enough friction to allow the table to hold tightly to the staff and yet not make it out of round.

SIMPLE WATERPROOF CASE OPENER

CONTEST ENTRY #51

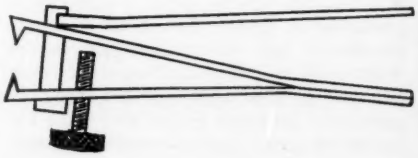
Small rubber vacuum cups can be obtained at auto supply stores. These cups applied with hand pressure will open the most stubborn screw back cases. They are also useful with screw back pocket cases; when re-assembling case, care must be taken to start threads carefully so that they do not cross and strip. If the cup is too large in diameter it can be cut down to fit the case back.

CANNON PINION TIGHTENER

CONTEST ENTRY #52

This might possibly qualify under "Ideas on Practical Bench Methods, Experiences or Tools." I made an excellent cannon pinion tightening tool from one of the newer nail clippers with straight-across jaws—this was drilled and tapped 3-48 and a small knurled thumb screw made.

I simply grasp the pinion between the jaws, bring the screw in contact and back it off slightly, then squeeze. There is no chance of cutting them in half or even nicking them too deeply.



A.H. & J. is pleased to announce the following winners of its December, 1954, Watchmakers' Contest:

First Prize: Arnold case-opening wrench and bench block to Mr. George Walker, Grand Valley, Ontario, Canada, for his "Filter to Eliminate Lint and Dust," Contest Entry No. 49.

Second Prize: Cannon pinion remover and bench block to Mr. Sol Azouz, 509½ Sixth Street, Las Vegas, New Mexico, for his "Replacing A Dial Foot," Contest Entry No. 48.

Third Prize: Cleaning brush, parts cleaning holder and bench block to Mr. T. W. Armitage, 4, Wortley Road, High Green, Sheffield, England, for his "Simple Bench Tool Tidy," Contest Entry No. 47.

Miracle of the Electronic Age

Watch Repairman and the OSCILLOSCOPE

By Carl H. Anderson

THOSE OF YOU who have been privileged to work at the bench for 50 or more years know how very seldom it is that anything new in horology really comes along. There has been so little actual advancement in the science and art of horology in the past 100 years that you can almost count the really worthwhile developments or achievements on the fingers of one hand and still have some fingers left over. True, there have been a few refinements, such as the perfection of the self-winding or automatic watch, the introduction of non-breakable mainsprings and a few others.

Most of us at the bench today are young enough to have seen the advent of the electronic era. It is only since the very early 1920s that the public could buy radio tubes and build their own radio sets. As the world goes—with its countless millions of years of age—from 1920 up to the present time isn't a drop in the bucket. When compared to man, it is only about one-third of the normal span of human life. Yet within those very few short years, electronics has developed faster and farther than anything man has ever known. Today, no one in his right mind would even venture to predict what electronics will bring forth in the next ten, five years —or even one year.

Electronics was very slow in entering the field of horology. Possibly it was because there were too few who really understood both horology and electronics. This may account for the lack of progress which has been made up to now. Insofar as the man at the bench in the retail jewelry store is concerned, the first electronic instrument he became acquainted with was the timing machine. On the other hand, the oscilloscope is fully fifteen years older than the timing machine, although it had not been used in horology. We do not know the exact or even the approximate year the oscilloscope was first used in watch factories, but we do know Elgin was using them prior to 1944. For the sake of all concerned, we are willing to concede that the timing machine was in use by retail jewelry stores in quite some volume long before the oscilloscope was.

On the other hand, the total number of oscilloscopes in use in all lines of industry and trade in the U. S. will probably run close to half a million, while the number of timing machines of all makes in use in the U. S. will probably run close to 35,000. We are unable to give you even an approximate number of oscilloscopes in use by watch repairmen and jewelers in the U. S., but we have positive knowledge of over 1,000 at the present time.

Swiftest Development in Horology

■ ALTHOUGH electronics is a comparative youngster as against the age of horology, electronics has shown the greatest and most rapid growth of anything man's brain has ever conceived. Never has man's ingenuity or inventive genius ever come forward with anything even remotely approaching electronics in its universal application all over the world.

About two years ago we were privileged to bring the oscilloscope and its use to the attention of the man at the bench. In exactly 22 months the number of watch repairmen using the oscilloscope has in-

The TIMEALYZER

Wendt-Squires, Inc., Takes pleasure in announcing a revolutionary new instrument for the watchmaker and jeweler

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WATCH FAULTS
AT A GLANCE

Watch timer and Oscilloscope combined!
One second per week accuracy!
"Tick" and "Tock" separation!
Electronic—Automatic!

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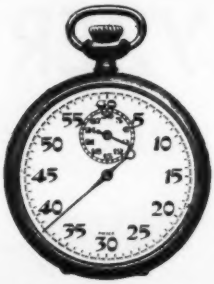

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creased from possibly none to well over 1,000. Practically all of that number have taken up the use of the oscilloscope in the past 10 months, as probably not more than 50 or so started using the oscilloscope during the first year of these articles.

We know that nothing in the history of watch repairing has caught on or its use developed as rapidly as has the oscilloscope. Even such commonplace watch repairmen's tools as screwdriver, tweezers, lathe, staking tool, friction jeweling tool, etc., never showed the growth or development in their early state that the oscilloscope has. It you could see our mail bag every day, you would begin to get some idea of how many thousand watch repairmen all over the world are seriously studying the use of the oscilloscope.

In the April, 1953, issue of *The American Horologist and Jeweler,* the oscilloscope burst in on the American watch repairman as unexpectedly and unannounced as anything that ever happened. If a man was standing out in the middle of a corn field on the 4th of July with the sun shining down brightly and nary a cloud in the sky when—lo and behold—all of a sudden he was struck by a bolt of lightning out of nowhere, he could not have been taken more unawares. What has happened in the intervening 22 months? First, there was an absolute zero start, a world of skepticism, thousands of "Doubting Thomases," thousands who openly said, "It is all a lot of hooey," "There's nothing to it," "What's this guy trying to put over?" and hundreds of similar statements. We are well aware of all of this.

What is the condition today, only 22 months later? Over 20,000 eager, avid watch repairmen in the U. S. alone anxiously await the next issue of *A. H. & J.* to find out "what's next?" But the American watch repairman is not alone. Our daily mail shows the same condition of interest exists in every civilized country of the world where watches are sold or repaired. No longer is it necessary to "sell" the watch repairman on the oscilloscope. Today he wants to find out everything about it that he possibly can. Never has his thirst for knowledge been so great.

Last month *A. H. & J.* readers received a real "What's next?" and this month we are in possession of much more informa-

tion which has been gained by personal observation and contact. We are now in a position to give you some real news—news which we confidently believe will prove to be the greatest announcement in the history of horology during the past 100 or more years.

First Announcement

■WE ARE INDEED proud that *A. H. & J.* is the horological journal to first publish the following information and, further, that we are the one who has been privileged and favored to write it up for you. We do not believe there has ever been in your lifetime or a few lifetimes yet to come, any announcement in the field of horology which will even remotely approach what you are about to read. We confidently believe an entirely new concept of watches, watch manufacturing, watch timing and watch repairing is about to be brought about in the minds of every watch manufacturer, seller and repairer.

In the January issue we quoted a letter which we received last October and made a few comments on it. Now the lid is off. No more secrecy on this remarkable new development. You can have the whole story just as rapidly as we can tell it to you. Before you read much farther your eyes will pop up until you will be positively "bug-eyed." You may even have to stop and catch your breath and wonder "what hit me?"

Because this is absolutely the most revolutionary development you have ever heard of, you will have to re-read this article many times before you begin to see its importance. Don't be surprised at what you are about to read, because when you first see and use this new wonder instrument you are going to say to yourself, "This guy Anderson didn't tell 10 per cent of the story—he didn't lay it on one-fourth heavy enough."

If you believe we have brought you startling new ideas and developments in the 22 months we have been writing these articles, better sit back, take a long, deep

FROM OUR MAILBAG---

Thanks a million for the many helps I am getting from your course.
—Vearl H. Grubbs

I am enjoying my course very much and am learning much.
—Leland Gatewood

The course has been very, very interesting, wish it could last indefinitely.
—Walter C. Timmreck

I am tremendously interested in your work and also progressing in my studies.
—Alfred J. Balasic

I read every word you write and study all your diagrams. I hope you keep it up for many a year.
—C. T. Madden

I would like to take this opportunity to thank you very much for your wonderful course. I learn something new every day and all is most helpful.
—Wesley K. Heath

Let me shake your hand (via U. S. Mail) and congratulate you for an entirely new treatment of our problems.
—George K. Burch

You are advancing the trade fifty years.
—John Leatherman

I am thoroughly enjoying my studies and have already benefited far beyond my investment in the course. (Written after having received only 6 lessons)
—Carley A. Brown

These are a few random remarks selected from our daily mail.

You will never know what you are really missing until you become a student of our Correspondence Course.

Why not find out how you can do better watch repairing more profitably?

WRITE FOR DETAILS.

THE INSTITUTE OF HOROLOGICAL OSCILLOGRAPHY

Carl H. Anderson, Founder

P. O. Box 578 Lexington, Kentucky

breath, get a good grip on yourself and be prepared for anything to happen.

This story really starts with the first article we wrote for the April, 1953, issue of *A. H. & J.* One of the men who read that article was an electronics engineer and hobbyist watch repairman by the name of Karl Wendt. We say hobbyist advisedly, because Karl is not engaged in watch repairing for a livelihood; he does it for the love of it. One of the very first letters we received from any reader was from Karl. At the time he was manager of advanced development engineering, Radio and Television Division of Sylvania Electric Products, Inc.

So without further ado, let us get acquainted with Karl R. Wendt. After graduating from university, he spent some time as research chemist with the Sun Oil Company. Then he spent 17 years with the Radio Corporation of America as an electronics research engineer. In 1947 he received the R. C. A. "merit award" which is the highest honor conferred on anyone by R. C. A. and in fact, has been conferred only a very, very few times. After this, he spent five years with Sylvania as mentioned above. He left Sylvania and in company with Bill Squires they formed their own company, Wendt-Squires, Incorporated. Karl is a member of the honorary scientific fraternity, "Sigma Xi," and also a "Phi Lambda Upsilon," an honorary chemical fraternity; a member of the American Institute of Electrical Engineers and a Fellow in the Institute of Radio Engineers. (Fellowships in the I. R. E. are honorary awards for outstanding achievements in the field of electronics and have been given to only about 500 of their 37,000 members.) He has had 30 patents granted and has many more now pending.

William (Bill) Squires (the other part of the Wendt-Squires, Inc., name) has had several years' experience with broadcasting and television stations, four years with Sylvania as an engineering specialist. He is also a lecturer on the University of Buffalo Engineering School faculty. He has many patents pending.

You now have the electronic background of the men who invented the "TimeAlyzer." Men who have the electronic know-how to really do things. These two men have had as much to do with the successful development of color television as any you can find. They are thoroughly versed in the science of electronics and you will not find any who are better qualified than they are.

Our acquaintance with Karl began with that first letter. He had been toying with the oscilloscope in his hobbyist watch work at his bench in his home. He conceived the idea of combining a timing machine and an oscilloscope. He made some experimental models and continued working with them at his home for over a year. A few letters passed between us and as

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Published by:

Office for Industrial Information

P. O. Box Stand 402 **Geneva (Switzerland)**

you read in last month's *A. H. & J.*, he did not answer my letter of April 29, 1954, until on October 25, 1954.

Karl found out early in his experiments that here was an entirely new instrument in the field of electronics on which no data was in existence. He had to work it all out from scratch. The "TimeAlyzer" is entirely new from beginning to end and likewise entirely different in circuitry from anything which has ever been known in electronics. He continued his research and came up with an absolutely new instrument, which is the subject of this article.

Before we go further, let us make emphatically clear we have no connection of any kind with Wendt-Squires, Inc., manufacturers of the "TimeAlyzer." We are writing this stictly as a matter of news because in our opinion it is the most newsworthy article to appear in any horological journal in many, many a year. We would have written the same kind of a story even if it had been the achievement of our worst enemy.

Instrument under test

■ WHEN we wrote Karl the fore part of December, he replied by calling us long distance to ask us to come down to the plant to see and try out the "TimeAlyzer" in person. So on the Sunday afternoon after Christmas, with Mrs. Anderson along, we did a "Shuffle Off to Buffalo." What we saw there completely dumfounded us. We had gone down there expecting to see something new and revolutionary, but nothing like what we actually saw. By the time you are reading this, we expect to have completed at least four weeks' actual use of the "TimeAlyzer" in our research laboratory. From what we saw and did while in the plant at Buffalo, we feel perfectly safe in saying you will find this new instrument to be all you expect of it. After we have finished our tests, we will publish a full report for you to read and will try to have it ready for the March issue of *A. H. & J.*, together with some oscillograms made from it.

We are now in a position to give you considerable information about the "TimeAlyzer" that we could not in our January article. First, is it a combination watch rate timer-oscilloscope, either one of which

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7 jewels on above $1.00 less

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3C GENUINE DUMONT TWEEZER
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12 ASST. USED MOVEMENTS, contains—2 ASST. Pocket size—8 ASST. 6½—10½L—ONE 3/0 S. Elgin—ONE 3/0 S. Waltham—ALL 12 for.....$9.95
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4 USED POPULAR MOVEMENTS: 1-AS 1194, 1-AS 970, 1-Font 120, 1-AS 984, all 7 jewel, tremendous value, COMPLETE FOR.....$9.95
1 GOOD USED AS 970—1 GOOD USED AS 976—Both 17 jewels, complete and in good order, both $9.95
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is far advanced electronically over anything that has been known up to now. In England practically all of the timing machines made there utilize the cathode ray tube incorporated in an oscilloscope, but the "TimeAlyzer" is totally different from any of them. The English instrument cannot be used as an oscilloscope in the way an American watch repairman uses it. The English instruments, as we understand them, are used exclusively for timing the watch. In the "TimeAlyzer" you can use it either as a watch rate timer or an oscilloscope, or a combination of the two.

With present-day American timing machines it is quite difficult and seldom possible to read the chart closer than two or three seconds in twenty-four hours. That is, of course, where the watch is not running near to perfect time. With the "TimeAlyzer" the standard factory adjustment is for a positive, accurate reading of one second in seven days (if the watch will run that good). By using the signal from Naval Observatory Radio Station "WWV" the "TimeAlyzer" can be adjusted by the user so he can adjust a watch to an accuracy of one second in fourteen days, if the watch is good enough and the watch repairman is capable of so adjusting a watch. We know hundreds of watch repairmen who have rightfully felt they could adjust a watch to a closer rate than their timing machine would show on the chart. With the new "TimeAlyzer" that same watch repairman will have full opportunity to "do his durndest" and if he has the skill and ability and is capable of adjusting a watch to where it will run within one second in a week (7 days), the instrument will tell him so right then and there.

There is another thing. Present-day timing machines will record only the "static" rate of a watch, that is, the rate of the watch while it remains perfectly still in the microphone. It will not give you any dynamic rates, that is, of the watch in motion such as being worn on the wrist or in the pocket. This new instrument will give the watch repairman any type of a dynamic rate that he can think of or is capable of giving to the watch. Not only can all position rates be taken the same as heretofore, but also the temperature, isochronal, resuming and recovery rates and all dynamic rates are as easily obtained as the static position rates have been in the past. Now it will be possible to hand a watch to a customer knowing approximately (within a few seconds) how it will run on the wrist or in the pocket. It all depends on the watch repairman's skill, ability and knowledge and not the instrument.

Not only the additional timing rates which are available, but also the determination of mechanical faults simultaneously with the taking of the timing rates will be of great benefit to the watch repairman. By watching the oscilloscope trace which is displayed on the screen of the cathode ray tube simultaneously with the taking of the rate of running of the watch, the watch repairman can instantly see in the trace any mechanical fault which appears in that position. (Frankly, we find it just a little difficult to describe all that is new in this

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Glass Domes supplied with wood bases, finished in black mahogany or walnut. Offer your customers the ultimate in attractive protection for fine china figurines, wedding cake ornaments, religious statuary, or other treasured object d'Art. Available in sizes ranging from 2½"x5" to 13"x27".

Clock Domes without bases individually packaged for full protection and ease of handling.

O.D	HT.	Price	O.D	HT.	Price
4 "	x7 "	$2.00	*4⅝"	x 8"	$2.00
4¼"	x 7½"	2.38	*5½"	x11 "	2.50
4¼"	x 7½" (with 1" hole at top)	3.50	7 "	x11 "	4.25
4½"	x8 "	2.38	7¾"	x15 "	6.25

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instrument and what it does because we are having to write it down on paper rather than point it out to the viewer as he sees it in the trace on the screen. However, we will do the best we can until you can see it with your own eyes.)

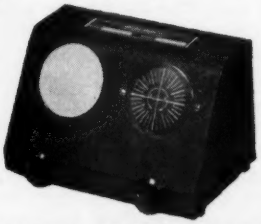
Those of you who have been using the oscilloscope know how much difficulty you have experienced at times in stabilizing your trace, that is, to get it to stand perfectly still. On your oscilloscope you have had your trace "bounce," "drift" and "travel" all over the screen. On the "TimeAlyzer" your trace is absolutely stabilized. It will stand just as still as the Rock of Gibraltar. You can, therefore, make comparisons that were impossible before. Even as much as we have worked with the oscilloscope for the past 20 years, the "TimeAlyzer" has completely changed our concept of what can be done. We now know many things will be accomplished and pointed out to the watch repairman that we could only dream about before. We knew there were many existing conditions but we could not conclusively prove them; now we can. Now we can see both the tick and the tock at the same time and instantly see the differences without photographing them or trying to remember them.

Entire new concept

THIS IS ONE TIME in our life when we are completely stumped for words. We actually do not know how to tell you the possibilities of this new instrument. We will simply have to use it every day at our bench and each month give you what we have learned during the preceding month. You will have to have patience and be prepared for anything to happen. If you have been startled or upset by some of our previous findings, we don't know what you are going to think when we write about some of the new avenues of research that have been opened up.

Pardon us for repeating, but we absolutely know this new instrument is going to give watch manufacturers and repairers an entirely new concept of watches, their repair and maintenance. We accord you the privilege of being just as skeptical as you wish but future articles will prove our statements. We are going to show you

To help you do
Better - Faster Work
The ALL NEW
PRECISE WATCH TIMER



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some oscillograms of conditions that you never dreamed were possible. No, we haven't "gone off the deep end" or "pulled out all the stops"—just a few of them.

You do not have to use a 60-cycle sine wave to time the escapement action. Every 3.03 milliseconds there is introduced a small pip (or break) in the horizontal time base line. Therefore, from any one pip to the next one is 3.03 milliseconds. If your trace of the escapement action occupies six full pips, the escapement action would therefore be taking place in 18.18 milliseconds, right on the nose. All you have to do is to look and see where the trace begins, then count the number of pips to where the trace ends, then multiply the number of pips thus ascertained by 3.03 and that is the time in milliseconds of the escapement action.

On your present oscilloscope you have only one trace at a time. On the "Time-Alyzer" you have two traces, one placed vertically above the other in position on the screen. Quite naturally one of the traces must be the tick and the other the tock. There they both are and you can make instant comparison of the differences in the trace of the tick and that of the tock, something you could never do before. This is accomplished with a "single gun" cathode ray tube. We have seen traces of both the tick and the tock displayed on the same screen simultaneously, but the negative half of one trace and the positive half of the other trace were cut off, therefore you had only one-half or one side of each trace.

With the "TimeAlyzer" you get both the positive and negative halves of both traces. There they are, one above the other, not superimposed one on top of the other so you cannot tell which is which. Neither the tick nor the tock is clipped in any manner whatsoever; both traces are complete and full. By a simple adjustment at the back of the instrument, the vertical distance between the two traces can be adjusted to any distance you may desire, or you can superimpose the two traces one on top of the other. As the instrument leaves the factory the two traces are separated about one inch.

By having the two traces displayed simultaneously, you can see each and every pip of both the tick and the tock. You can see instantly if there is any difference in any one of the hundreds of pips of the tick and the tock. Above all else, you can do a job of escapement matching that has never been possible before. Also, you can see errors in setting the pallet stones that were never before possible of detection.

For example, let us say the time of the roller jewel striking the fork slot on the tick side and also on the tock side are exact in timing to the 100-thousandth of a second. Also that after let off of impulse, the lever strikes the banking pin on each side at the same exact time to the 100-thousandth of a second, but you instantly see that the impulse on one side is a little sooner on that side than it is on the other side, or the escape wheel tooth strikes the pallet stone at safety lock a 100-thousandth of a second sooner on one side than it does the other. These things are possible because you have the trace of

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the tick and that of the tock displayed separately but simultaneously, one vertically above the other on the screen of the cathode ray tube. You can instantly see if the pallet stone is tilted at a slight angle in the slot of the pallet, thus making the draw angle different on one side than it is on the other. You can instantly see if the unlocking resistance is greater on one side than it is the other. You can see the difference in impulse on the two pallet stones. You can see the difference in force with which the roller jewel hits the fork slot at entry, etc., without end.

We could go ahead and fill this whole magazine with things that can be seen in the traces of the "TimeAlyzer" that cannot be seen in the trace of the usual oscilloscope or seen on the usual timing chart. We will try to have some oscillograms for the March issue in which we will clearly point out some of these things, such as being able to see when one banking pin is a little farther from the line of centers than the other one is. Did anyone ever tell you you could match an escapement or set pallet stones from a timing chart? We do not believe it possible but, brother, if you have a pair of eyes in your head, you sure can do these things with the "TimeAlyzer" and do them to perfection, and we mean setting pallet stones to less than 100-thousandth of an inch error between the two. It is as simple as "falling off a log."

Details of 'TimeAlyzer'

LET US CONSIDER the beat of a watch. With the "TimeAlyzer" you can see an out-of-beat condition of less than one 100-thousandth of a second, because you have right before you the trace of both the tick and the tock and the eye can instantly see if they are vertically in line, or one is slightly to the right or left of a vertical line. You can see if the watch is in beat during any part of the escapement action and is likewise out-of-beat during another part of the escapement action. You will be enabled to get "in beat" conditions that no one ever dreamed possible.

Another thing, *there are no moving parts* in the "TimeAlyzer." No motor, no stylus, no printer bar, no armature, no solenoid, no ribbon, absolutely nothing

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that moves except, of course, the controls and their dials. Think what that will mean to you. No chance for the mechanical errors of motion.

The accelerating voltage of the cathode ray tube is 4,000 volts, which we believe to be the highest used in any oscilloscope other than laboratory models. What does this mean to you? It means no "fuzzy" or broad lines or pips. You will see the sharpest, cleanest pip lines you have ever seen on an oscilloscope. Lines as sharp or sharper than you can draw with a fine lead pencil; about as sharp as a hair out of your head. No more broad pip lines which are so fuzzy on the edges that the fuzziness of one pip line overlaps the fuzziness of the next line. You will get the sharpest, cleanest, clearest, brightest oscillograms you can imagine.

We cannot begin to tell you all about the circuitry, as practically all of it is brand new and has never before been used in any electronic instrument. Some of the major things sought in the development and design of the instrument have been absolute stability and sharpness of the trace as well as simplicity of controls. In spite of all the instrument does and the fact that it takes 33 radio tubes and all their associated circuits and parts to accomplish it, the controls on the front panel are such that the usual sales girl in a jewelry store can immediately use the instrument and tell whether or not the watch is in good or bad condition. Of course she won't be able to read the traces and tell what is mechanically wrong with a watch as that requires study the same as it does to use any other oscilloscope. All that we have ever written regarding the reading of oscilloscope traces applies to this instrument without any revisions or changes, but with the addition of very much more. All of the tubes are standard radio tubes and can be obtained from any radio dealer should one need replacement.

There are five controls on the front panel as follows: *(1)* The on-and-off switch. *(2)* The beat switch, which sets the instrument for the standard 5-beat (18,000 beats per hour) watch, the 5½-beat (19,800 beats per hour) and the 6-beat (21,600 beats per hour) watches. You don't get a slanting line on a chart which you must read as so many seconds or minutes fast or slow per day, or a chart with any number of rows of dots. The use of the instrument for 18,000, 19,800 and 21,600 beat watches is absolutely the same. All you have to do is to set a small switch to one of three positions. *(3)* Tick amplitude, this controls the amplitude of the trace on the screen of the oscilloscope, or, it is the same as the volume control on a radio. *(4)* The watch rate, which gives you that rate at which the watch is running, either fast or slow, from zero to 600 seconds a day. This dial actually works in four-second jumps and for values under four seconds per day the rate of drift may be used. *(5)* Slow-Fast switch is set in the Fast position when the watch is running fast or the Slow position when the watch is running slow.

There are five controls on the back apron and one above the apron which may be adjusted, but are properly set when the

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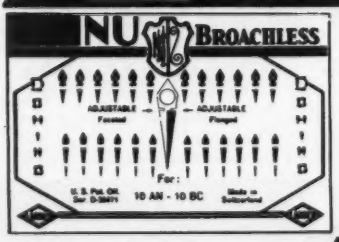

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instrument leaves the factory and should never need changing even if all 33 tubes are changed at one time. They are put there for any possible future need, should one ever arise. The five on the back apron are: Horizontal centering, which is to center the trace in the horizontal center of the screen; beat separation is to separate the tick from the tock or to bring them together as one single trace; certical centering is to center the trace in the vertical center of the screen; astigmatism is a focus correction adjustment so that the pip lines of the trace aren't darker in any one direction than they are in another. It is the same as astigmatism in your eyes when you have them examined and you tell the optometrist that the lines on the clock dial are blacker from 11 o'clock to 5 o'clock than they are any other place on the dial, or that they are blacker from 9 to 3, etc.; the brightness control determines the brightness of the trace and the focus control focuses the electron beam down to the sharpest possible line. There are also some other adjustments on the inside of the instrument which are all set at the factory and should never be altered or monkeyed with.

Cleanest possible trace

THE INSTRUMENT uses a five-inch cathode ray tube and we quote the following from a recent letter from Karl Wendt which was received after our return from Buffalo:

"We are using a five-inch tube since it makes considerable difference in the cost of the instrument. We feel that the important thing in this matter is the spot size; that is, a fine trace on a five-inch tube may show very much more than a coarse trace on a seven-inch tube. For this reason we are using 4,000 volts on the tube, which is the maximum allowable for this type tube. We are also using a long persistence phosphor. Two things make this possible: first, the fact that the tick and tock, which are considerably different, are separated, and second, the trace may be made to stand still. Under these conditions we feel that the long persistence phosphor is much easier on the eyes and less critical for photography. We normally set the beat separation knob so that the two traces are about one inch apart. This,

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however, can easily be changed in the back for a larger separation or no separation at all."

We have never seen on any seven-inch oscilloscope as clean a trace or a trace as large vertically and horizontally as there is on the "TimeAlyzer." With other oscilloscopes where the accelerating voltage is of the order of 1,100 or 1,300 volts, it is absolutely necessary to use a seven-inch cathode ray tube, but using a five-inch tube in the "TimeAlyzer" they have accomplished a larger, cleaner, sharper, more useable trace than we have ever seen on a seven-inch tube. The persistence of the phosphor is such that should the tick be the first to be displayed on the screen, it will still be in the phosphorescent stage when the tock comes on the screen in the fluorescent stage. The tick will decay in plenty of time for the next tick to appear in the fluorescent stage and not leave any carry-over.

The screen used is known as "P12" and has both an orange-colored fluorescence and phosphorescence. The R.M.A. Standards Manual lists it as being composed of zinc magnesium fluoride. Heretofore, the P12 screen has been used in fire-control radar and for scanning rates between four and 15 scans per second. It is quite easy on the eyes and can be viewed all day long without any eye fatigue. We haven't looked up the P12 photographic characteristics and will give you that information in a later article.

The instrument is such that it can be used in factories on production line work by totally inexperienced girls so that they can turn out perfectly matched watches. They can be taught any single checking or testing operation in a very few minutes. Also for production line work the correct trace can be drawn on the reticule and the "go and no go" pattern can likewise be indicated on both sides of the norm or standard. The operator can thereby instantly pass or reject.

The frequency standard is a quartz crystal vibrating at 99 KC instead of the 81 KC such as usually employed in timing machines. The crystal is of the usual "plug in" type and looks much the same as a metal radio tube. Crystals are very easily changed, so if some "monkey" brought out a watch that beat 20,132 19/73 times per hour, a suitable crystal could be plugged in. (Note: That was only a random figure, as a watch which had such a beat would never show time in hours and minutes as we know it.)

You have never seen or heard of an instrument quite like this one. You have everything in one instrument and so simple in operation that you will be amazed the first time you use it. We fully believe the "TimeAlyzer" will completely revolutionize all past concepts of determining the time rate of watches or finding mechanical faults in them. We are quite sure you will agree to this the first time you use it. We consider it to be the greatest advance in horology yet known. You may say, "This guy Anderson has really gone off the deep end this time," but believe us "you want to smile when you say them thar words, podner" because you are going to "eat them words" when you see it demonstrated. You really have something to look forward to.

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There is an entirely new type of microphone. On present timing machines, you place the watch in the microphone and without moving the watch, by merely turning the microphone, you get the dial up, dial down, pendant up and pendant down "static" rates. But when you want to take the pendant right and pendant left "static" rates, you must move the watch in the microphone. On this new microphone you put the watch in it *only once,* and you *never move the watch* no matter which static or dynamic rate you wish to take. You get all rates without touching the watch, all the usual "static" six-position rates, or you can use our "14-position adjusting chart" which we recently published, as well as get any "dynamic" rate you can think of. This is an entirely new type of double-axis rotation microphone which is not built like the "gimbal" of a marine chronometer. You merely rotate the microphone into any position you desire.

Attractive appearance

ONE OF THE most important things is an absolutely blanked out return trace. On practically all modern oscilloscopes the return trace is quite distinct as you have noticed in the oscillograms we have published in the past. As a matter of fact, the electron beam is blanked out four-fifths of the time which means the phosphor of the screen is energized only one-fifth of the time. The phosphorescence of the screen is such that it continues to glow all the time even after the electron beam has passed over, but completely decays before the next trace appears.

Slow and fast running of the watch is indicated by the drift direction of the pattern, slow drifts to the right and fast drifts to the left. You merely turn a small dial until the drift is stopped and the trace stands perfectly stationary. Then you look down at the dial and read it either in minutes or seconds as the case may be.

The appearance of the cabinet is such that it can be placed on the counter of any million-dollar jewelry store and be an addition thereto. It is very highly styled and finished in harmonious colors. The general external appearance of the instrument is such as to command instant attention from any who espy it. It will hold

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You may feel this article to be quite a sales document for the "timeAlyzer" but it most certainly is not intended as such as we are in no way connected with the sale of the instrument. We have honestly tried to give you a true, factual reporter's story on what we believe to be the most important horological development in our lifetime.

We think so much of the instrument that we have made arrangements to carry one around the country with us wherever we go on our various lecture and demonstration trips. We know we can show our audiences many things we have never been able to before; althought we knew these things were in existence we could not demonstrate them. Now we feel we have the absolute acme of accomplishment and we sincerely hope we will be able to take full advantage of all of the instrument's possibilities. Probably one of the first places we will use the "TimeAlyzer" in a lecture will be in Ohio, the middle or latter part of February. If you live in that section of the country, you will receive a notice of the meeting in the mail about the same time as you are reading this. early in the spring we expect to take a trip down through Tennessee, Alabama, Mississippi and Arkansas. If there are any guilds or groups of watch repairmen in those states who would like to have us address them at that time, we should be glad to hear from them so we can make the necessary arrangements.

The science of horology owes a real debt of gratitude to Karl Wendt for his creative genius, electronic knowledge and inventive skill in bringing the "TimeAlyzer" into being. He is to be sincerely congratulated for what he has done for all of us. This is once in the history of horology that we all owe our sincere thanks to a "hobby" watch repairman.

Mark well and remember the February, 1955, issue of *The American Horologist and Jeweler* because in a very few short years it will be a real collectors' item. In after years you can look back and say you saw the concept of an entirely new method of watch timing and determination of mechanical faults in a watch. You will want to put this copy of *A. H. & J.* away with your will, insurance policies and other highly valued papers, because some day, 50 or more years from today, you can get it out and say to your friends: "Here is the first magazine article that was ever published about the 'TimeAlyzer,' the most revolutionary development in the history of watch manufacture, maintenance and repair." This is a real history-making issue of *A. H. & J.*

Some day that little grandson of yours who is now crawling around on the floor at your feet will be sitting at his bench repairing a watch and you can lay your hand on his shoulder and say, "I remember the first announcement of the 'TimeAlyzer.' It startled me and I could not realize what it would mean to future generations of watch repairmen like you."

Please forgive us if our report of the "TimeAlyzer" and our trip to the factory has taken up practically all of this article.

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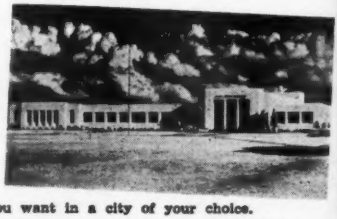

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All we can say is, just wait until you see and use it, then you will know. It is the instrument of limitless possibilities.

You will find a full page ad of the "TimeAlyzer" in this issue of *A. H. & J.* and it will be regularly advertised herein every month hereafter. In fact, it will be advertisely exclusively in *A. H. & J.* We will be very happy to answer any questions our readers may wish to ask us about this instrument. Just enclose a stamp, no envelope, please. We understand literature is now on the press and should be ready by the time you are reading this.

Report on 'Precise'

■ WE HAVE RECEIVED several hundred letters from readers asking for a report on our tests of the Precise Watch Timer. We are glad to report they were entirely satisfactory. If you want a timing machine which does not print a chart, you will find it will do all the manufacturer claims. Incidentally, connections have been brought out on the back of the instrument so you can use the oscilloscope with it. All you have to do is solder two wires to a small plug about the size of a lead pencil eraser and connect the two wires to the vertical input of the oscilloscope.

We had a visit from Fritz Monson, president of Precise, the fore part of January. He told us one thing which interested us very much. He said that from his first ad in the December issue of *A. H. & J.* he had received up to the fore part of January more than 1,000 inquiries, of which over 750 volunteered the information they read about it in this column. That proves two things to us: One, watch repairmen do read *A. H. & J.*, and two, that they will write in answer to an ad where there is something advertised in which they are interested. Fritz also said he placed the same identical ad in another trade paper and that up to the same time, he had not received one single inquiry from it. Wonder how come the score on replies was over 1,000-to-nothing? Mr. Advertiser, doesn't that give you something to think about? Don't take our word for it—write Fritz and find out for yourself. Fritz said he learned a lesson and that from now on his advertising will be concentrated in *A. H. & J.* As we said once before, we aren't in the employ of *A. H. & J.'s* advertising department, but it sure does us a whole lot of good to know that if you have something of interest to the watch repairman that *A. H. & J.* is the place to advertise it if you want concrete results. Score another hit for *A. H. & J.* (Hey, maybe we better quit writing this column and get a job in the advertising department, huh!)

New oscilloscopes

■ ABOUT THE MIDDLE of December we received catalog sheets on a couple of new oscilloscopes. One is a 21-inch model and the other is 17 inches. They look exactly like your TV set, cabinet and all, except for the multiplicity of controls on the front panel. So far as we know, this is the first time any oscilloscopes larger than seven inches have been made on a commercial or production basis. These would be ideal for a watch repairman if he had the room around his bench for one of them. Imagine setting a 21-inch television set down beside your bench and you will have it. These instruments are ideal for use in factories. When they are used in production line testing, the pattern can be drawn right on the reticule so an inexperienced girl can make the tests and know whether to accept or reject. Just in case you think you are interested, the prices start at $1,245.00 and go up to $1,555.00. If any of you are interested, drop us a line and we will give you the manufacturer's name and address. We wrote the manufacturer for an electro and hoped to receive it in time to publish it with this article, but so far it has not been received as we go to press. We thought perhaps you might like to see what such an oscilloscope looks like.

Oil tests progressing

■ OUR LIFE TEST on 32 different watch oils is progressing nicely. With the new "TimeAlyzer" we can see instantly any changes or differences of the oil on either the tick or the tock side.

We definitely promise you some very interesting oscillograms within the next month or two.

Pictured at Hathaway plant in Denver are, left to right: Orville R. Hagans, Editor and Publisher A. H. & J.; Hamilton's John A. Connon, General Manager of Hathaway Co.; Robert B. Thompson, Hamilton's Executive Vice President; Claude M. Hathaway, President of Hathaway Instrument Co.; and Arthur B. Sinkler, President of Hamilton Watch Company.

Hamilton Acquires Electronics Instrument Firm

THE HAMILTON WATCH COMPANY, last January 12, acquired all the outstanding shares of the Hathaway Instrument Company, 1315 S. Clarkson St., Denver, Colorado. The transaction was completed in Hamilton's executive offices between Hamilton's president, Arthur B. Sinkler, and Claude M. Hathaway, president and former owner of the instrument company. The Hathaway Instrument Company produces high quality electronic instruments and measuring devices.

In an official statement, Mr. Sinkler said: "The combination of Hamilton's unique skills in the miniature precision field of watchmaking with the electronic experience of the Hathaway organization offers the ultimate integrated operation for this electronic age. Never before have watch manufacturing skills been coupled with pioneering electronic development. We are confident that the Hamilton-Hathaway combination will develop new and unusual miniature electronic and electromechanical instruments and systems for both industry and government.

"We are confident that the watch industry also will follow the pattern of

other industrial development into the electric and electronic fields. The Hathaway organization will make substantial contributions to the development of electric watches, clocks and other timing instruments by Hamilton.

"In the past few years we have broadened the base of Hamilton's production through the acquisition of a watch case plant and production for national defense. We are now entering a new field, which we find most promising with a company that is already a leader in that field. The combined resources of Hamilton and Hathaway should provide growth opportunities not available to either company by itself.

"While diversification seems essential for the growth of the Hamilton Watch Company, we are mindful that the manufacture of watches continues to be our principal activity. Here at Hamilton our interest in adequate tariffs on watch movements has not lessened. The actual production of watch movements in the United States is essential to national defense. We are encouraged that the action of President Eisenhower restoring the tariff rates on watches in July, 1954, will assist the industry to reverse the downward trend of domestic watch production. While encouraged by the President's action, we at Hamilton will continue our program of diversification as a further safeguard to the jobs of our employees and the interests of our shareholders."

In a statement to *A. H. & J.*, Mr. Sinkler observed that the skill and facilities of the Hathaway Instrument Co., combined with that of the Hamilton Watch Co., will bring about a more rapid development of the Hamilton Electronic Watch.

Claude M. Hathaway, the founder of the company, will continue as president and John A. Connon, formerly assistant to Lowell F. Halligan, Hamilton's sales vice president, will move to Denver to become general manager. The Hathaway organization will be retained in its present form except for the addition of Mr. Connon, who will handle general business administration and help to expand the sales and marketing activity.

Hamilton Executives Visit Denver Plant

AT A DINNER held January 19 at the Denver Club, three executives of the Hamilton Watch Company met with the officers and key employees of the Hathaway Instrument Company, Hamilton's new subsidiary in Denver. Arthur B. Sinkler presented a chronometer to Claude M. Hathaway, president of the instrument company.

In making the presentation, Mr. Sinkler stated: "Before 1940, not a single marine chronometer had been produced anywhere in the world through the use of mass production techniques. When the source for the older hand-made models was cut off, Hamilton commenced the production of this instrument using interchangeable parts and mass production methods. We believe that it is our finest contribution to the field of mechanical precision instruments. The future holds much promise when the mechanical skills that could produce this instrument are coupled with the electronic experience of your organization."

Mr. Sinkler explained that he and Robert B. Thompson, executive vice president of the Hamilton Watch Company, reviewed facts concerning more than one hundred companies before the association with the Hathaway Company was completed. "We have been tremendously im-

Arthur B. Sinkler and Orville R. Hagans watch Joe Christensen, 1949 graduate of American Academy Watchmakers' College, operate a galvanometer in a Hathaway process.

pressed with Mr. Hathaway and with his entire organization," said Mr. Sinkler. "We are pleased also to be associated now with the progress and expansion of this beautiful city. I think it is appropriate that our company should enter its program of expansion in Denver which has more than doubled in size in the past ten years and for which the future is most promising. As a corporate citizen of the community, we hope to contribute to this impressive growth."

Claude M. Hathaway— 'The Man Who Measures Trouble'

■ IT WAS A MOST HANDY MANEUVER that the B-29 pilots had developed. It baffled enemy anti-aircraft units.

There was only one hitch. The maneuver sometimes ripped the tail assemblies off the giant Superforts. So the army air forces asked Denver's Claude Hathaway if he could find the point of strain on the bombers. Hathaway could, and did. Boeing Aircraft did the rest, strengthening the weak point to permit the maneuver.

When the first experimental rockets thundered up from the floor of New Mexico's Gypsum desert, Hathaway was there, an honored guest of the Army Air Forces. Why? Because the supersonic bolts carried Hathaway designed instruments.

It hadn't always been this way. Some thirty years earlier, Claude Hathaway had played on this same spot, a thoughtful, quiet youngster who liked mechanical things and hated spelling and reading.

He had a passion for things with "works" and that was that.

Today, high-flying airmen, pilots of fleet Diesel trains, surgeons—these and many others—all benefit by Hathaway's early love for gadgets.

When he was 13, the Hathaway family left New Mexico and moved to Colorado Springs. The youngster persuaded his mother that school was no place for him, and got a job with the Colorado Springs Light, Heat & Power Co.

He was happy, working with his beloved sciences, and was promoted rapidly. But in his late teens he realized that his mother had been right, that an education was essential. He bought books and studied at night.

In 1921 he applied for admission to the school of engineering at the University of Colorado. The registrar asked for his credits. Of course Hathaway had none.

Claude M. Hathaway

Academic brows arched. Surely Mr. Hathaway realized that one must have pre-college credits. Perhaps if he would finish high school and then come back . . .

Hathaway coaxed. Finally he was permitted to take the regular entrance examinations. His grades: Algebra, 100; trigonometry, 100; analytic geometry, a miserable 96. He entered college.

By 1929, working his way, he had received, with high honors, bachelor's and master's degrees.

In 1930, Hathaway met and married Hazel Wiseman, daughter of a Bennett, Colorado, pioneer family. The couple moved to Schenectady, where Hathaway rocketed to prominence as a General Electric engineer.

Seven years later the couple returned to Denver with $5,000 savings. Immediately four-fifths of the savings went into a consulting engineer's "laboratory" in the basement of the family home at 517 South University Boulevard.

By 1940, there were five men besides Hathaway working—often late into the night. One thing that still puzzles this man, who is so at home in the realm of

Euclid, is why there was never a complaint from the neighbors.

Late in 1940 he bought a building at 1315 South Clarkson Street, where his plant stands today.

To augment his consultant business, Hathaway started making sorely needed instruments to measure stresses and strains in structures. One of his first clients was the Association of American Railroads for whom he built complete strain equipment.

Came December 7, 1941, the "Day of Infamy." There were grave doubts about capacity of a railroad bridge in the southwest to carry punishing war loads. If unsafe, a million dollars worth of high priority material would have to be diverted for its repair. Uncle Sam wanted to know what to do.

Hathaway tested the bridge with the A.A.R. equipment and pronounced it safe. It is still in use.

There were other war jobs—finding the strain on a submarine mooring cable, designing a strain analyzer for a plane in combat, furnishing a special oscillograph here, a strain gauge there. Hathaway did all he was asked and more.

A month before "Operation Crossroads," the Bikini atom bomb tests, a special plane landed at Stapleton airfield and a high army official was sped across the city to the Hathaway plant. Said the official:

"We need equipment to set off instruments, cameras and recording devices with the bomb detonation. Can you make it?"

Hathaway and his engineers went to work. They designed, built and delivered the equipment in less than thirty days.

Today of White Sands, N. M., powerful V-2 rockets send back to earth vital information by means of Hathaway instruments.

So much for war work. Hathaway is just as vitally concerned with work for peace.

Take the matter of blood pressure. All of us have watched our doctor wrap a band around our arm, then pump it up. But this method shows only the maximum or peak pressure.

Doctors wanted to know how the pressure varies during each millisecond of the heart's beat. They asked Hathaway.

The genius of measurement built an electrical pressure gauge so small that it fits into the barrel of a hypodermic syringe. The syringle is placed into a vein and the gauge transmits, onto a graph, a perfect picture of blood pressure variations.

Good, but how about pressure inside the heart itself?

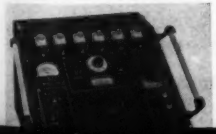
Hathaway built another electro-magnetic pressure gauge, this time about the size of a grain of rice. He attached it to the end of a catheter tube. A trained surgeon can place the tube in an arm vein and gradually work it forward until the gauge end is in the heart itself. The gauge sends back its vital pressure message by electrical impulses through wires in the tube.

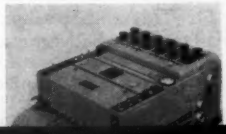
The Hathaway standard oscillograph is known the world over. It can measure strains or physical changes occurring within one ten-thousandth of a second.

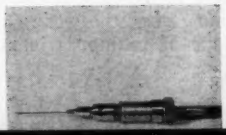
That wasn't fast enough for the Pratt & Whitney Aircraft Company. For them Hathaway built, for a mere $25,000, an oscillograph that measures strains occurring within one two-hundred thousandth of a second.

You can ask Hathaway today what goes on inside your heart, inside a block of steel, a yard stick, or even inside the bailiwicks of constellations. Chances are he can tell you. Industries and governments the world over call on him for the solution of difficult problems of measurement.

Some of the equipment manufactured by the Hathaway Instrument Co., new Hamilton Watch Co. subsidiary in Denver, Colorado: Left, Type RS-10 six-element strain indicator. Center, 12-element laboratory oscillograph, Type S8-B. Right, pressure gauge fitted into barrel of hypodermic syringe, which measures blood pressure and registers changes down to a millisecond of a heartbeat.







Jewelry Repairing

By R. ALLEN HARDY

Mr. Hardy invites your questions pertaining to jewelry repairing. Questions should be directed to Mr. Hardy, c/o The American Horologist & Jeweler, Box 7127, Capitol Hill Station, Denver 6, Colorado. Please enclose a self-addressed, stamped envelope.

Diamond Setting is Fascinating Work

DIAMOND SETTING appears to be one of the most fascinating phases of jewelry work to the tradesman who appreciates fine work and likes to do it. There is just as much thrill and job appreciation in setting a diamond beautifully as there is in making a fine watch keep perfect time—or in executing a beautiful engraving job. More and more jewelry store technicians are mastering the art of stone-setting thereby increasing their value to their employer. A combination man who can do all jobs well is certainly respected by his customers, his employer and by his fellow craftsmen.

I know of no other phase of work connected with jewelry repairing that has been more feared than diamond setting. Many watchmakers and engravers, with their highly sensitive touch, have hesitated to enter into diamond setting simply because of the natural hesitancy to attempt such a precarious operation ($500.00 to $1,500.00 diamonds create quite a psychological factor, enough to affect one's blood pressure during the setting). For a beginner the "pressure" is great, but experience soon proves that the larger diamonds are easier to set than melees.

Setting a Diamond in The Illusion-Type Setting

■ SINCE the detailed mechanics of measuring and burring out a seat for the diamond setting jobs (to be discussed in this issue) have been covered in previous issues of the *American Horologist and Jeweler,* we will direct discussion to "finishing off" the illusion-type and the fishtail style of setting.

See *Figures 68* and *69* for a beginning view of an illusion mounting. This varies from the fundamental designs previously discussed in two distinct ways. The bead section is raised and partially shaped, waiting only to be pushed over the edge of the girdle (after seating). The other feature is the ring of metal surrounding the stone after the setting is completed. This type of setting is intended to flatter the size of any stone, making small stones appear larger and more brilliant.

After burring out a seat for the stone *(Fig. 70)* the beads are worked over the edge of the girdle as shown in *Fig. 71.* First use the round tool (No. 51 or No. 52). Place it far enough back from the edge of the raised bead section to insure an adequate bead. By "wiggling" the tool from side to side *(Fig. 71a)* the metal automatically curls over the edge of the girdle. *Fig. 71b* shows the beading tool shaping the bead and pressing it firmly against the stone. It is wise, of course, to work from corner to opposite corner so that the stone may be kept level.

See *Fig. 72* for the finished setting job. Each corner appears to have four beads,

although only one holds the stone. The large center bead is a protective bead, the two side beads merely ornamentive, while the other bead is doing the job of securing the stone.

Since the illusion mounting is fashioned so that all beads are raised, very little "trim-up" work is required. All that is necessary is to clean out any metal burrs remaining between the beads and to bring all beads to a high polish.

While an illusion setting is generally adaptable to a fairly wide range of sizes, the stone must be matched very closely to the correct mounting. There is no leeway for "squeezing in" or "spreading outward" to accommodate stones that do not really fit the mounting.

Setting a Diamond in A Fishtail Mounting

The fishtail mounting, as shown in *Fig. 73,* is a very flexible type of mounting. The prong treatment may be varied or shaped in a number of ways. They may be treated like pointed prongs or rounded beads.

Due to the construction of the fishtail mounting, slight expansion or "shrinking" is possible. If the stone to be set is a "shade" too large for the mounting, it is possible to spread the four corners outward by bending with smooth-jaw snipe-nose pliers. This procedure should never be carried to the point of distortion. It is better to delay the job and order a mounting of the correct size, one that will fit without plier manipulation. It is always possible to mar or nick or flatten the artistic designs at the corners while bending, so it would appear best to consider all these possibilities before deciding to expand or "shrink" any mounting.

To begin setting a diamond in a fishtail mounting, it is well to try to visualize how much metal will be left to work with after the seat is formed. To do this, place the diamond in position on top of the head. With the eyes directly over the mounting (held in a ring clamp) it is easy to see how much metal will remain. This will govern the decision as to how the claws (or prongs) will be formed. If the remaining metal is great, a heavy, triangular prong may be best. *(See Fig. 74.)*

If the remaining metal is "scant," it would be advisable to leave as much as possible, by not filing, but by shaping the prong in a "rounded bead" fashion. It is very easy to shape the tip of a prong with a beading tool and by simply removing the little burrs that normally occur during the procedure. The beading tool serves especially well to press the tip firmly against the stone. For the heavier triangular prongs a pusher is used. *(See Fig. 75.)*

But let us follow the operation step by step. The first step is to seat the stone properly using the flexible shaft machine and a burr slightly smaller in diameter (that is, if the dimension does not match the stone exactly, which is rare).

Next, using a jeweler's thin saw-blade, make two cuts (one at *"a"* and one at *"b"*). *(See Fig. 76.)* The depth of the cut equals the depth of the seat of the stone, or where the girdle will rest. Now, three islands of metal are observed; one will be

Fig. 68

Fig. 69

Fig. 70

Fig. 71

Fig. 72

Fig. 73

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a protective prong, the other two will be the "duty" prongs—holding the stone.

Our next operation is to file the two "duty" prongs diagonally, as shown in *Fig* 77. This prepares the surface of the tip for the "pushing-over."

After the sawing and filing operations, some chance burrs may have collected around the seat and it may be necessary to clean these out by using the original setting burr with a very light touch. When the seat is clear place the stone in position and begin "pushing-over" the prong tips. Any one prong may be selected. Gradually push the tip in a half-pushing, half-burnishing manner, using the long side of the "pusher" tip. As it begins to bend, change immediately to the exact opposite prong, working it over equally as much as the first prong. It is very important to proceed gradually, always pushing a little at a time, continuously "swapping" corners until the stone reaches a degree of firmness. This careful procedure is to prevent any possibility of the stone getting off-level.

When the stone has become fairly firm, continue to tighten completely by using the short side of the prong-pusher. The flat-tipped round pusher shown in *Fig*. 79 is also helpful at this point.

When the stone is thoroughly tight, the cleaning and shaping-up procedure begins. Using a jeweler's small barette file (with rough edges smoothed out on an Arkansas stone—this to prevent any damage to the

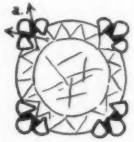

Fig. 74

Fig. 75

Fig. 76

Fig. 77

Fig. 78

Fig. 79

Fig. 80

thin edges of the girdle) shape each prong tip as shown in *Fig. 74*.

There are many fine little details that have not been mentioned, details that aid greatly in quickly and expertly finishing the job. By using a small flat tool (No. 36 or thinner, in some cases) the space between the "duty" prongs and the protective prong may be cleaned out in one cut or stroke of the graver. See *Fig. 74a* for direction of cutting strokes. The graver should have highly polished surfaces so that each cut will leave a high polish.

The final polishing (on the polishing lathe) is done with a stiff bristle brush to which rouge has been applied lightly.

As a final check, it is advisable to rub the prongs over a fuzzy cloth to determine if any prong needs further attention. If a prong tip is not flush with the stone, it is likely to "pick up" threads or pull at the cloth when rubbed.

Fig. 78 shows a view of the two-faced prong-pusher. The square steel stock may measure about 4 mm. The over-all length of the tool should be no more than 3½ inches.

The faces should be filed to a shape as illustrated—one face being considerably longer than the other. This creates two different planes with which to approach the prong tip to be "pushed." It is not necessary that the steel should be hardened. The faces after filing perfectly flat should be left with a dull line-finish to minimize the likelihood of "slipping off" when "pushing over" a prong.

A similar "prong pusher" of smaller dimension (2 mm. square) may be made and used to good advantage on very small mountings. This one should be hardened and tempered to a straw color, else it would bend out of shape during continuous use.

Fig. 79 illustrates the shape of a round, flat-faced prong-pusher. Its diameter may be between 2½ mm. to 3 mm., its length no more than 3½ inches. This pusher is used for finishing touches such as being sure the tips are firmly pressed against the diamond, or for simple stone tightening operations.

Fig. 80 shows a cross-section of a beading tool tip, illustrating how its concave tips form a bead, or shape the tip of a prong.

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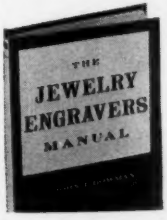

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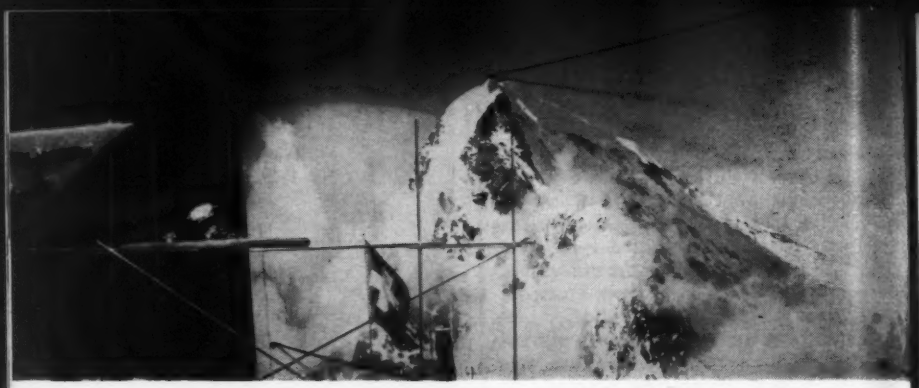

25th Swiss Watch Fair

In Planning Stages

THE 25TH annual Swiss Watch Fair, a part of the Swiss Industries Fair in Basel, Switzerland, is scheduled April 16 to 26. Now in its planning stages, the watch phase of the Industries exhibit is described as a "Fair within a Fair" since it covers all segments of watchmaking and jewelry operation. The exhibit is considered one of the most important sales promotion aids in the watchmaking industry.

The accompanying photographs illustrates a few of the display techniques used at Basel Fairs. Heavy emphasis is placed on lighting and arrangement devices with props chosen to tell a story or establish a mood without detracting attention from the watches themselves.

Topical themes in such fields of achievement as mountain climbing, underwater sport, racing and science are used to emphasize horological progress through the years.

Outstanding in display treatment is the application of spot lighting. However, watch display experts for the Fair caution against the excessive use of neon lighting which, they contend, robs precious metals and jewels of their natural brilliance. They point out, incidentally, that women avoid heavily-lit neon windows because such lighting produces unflattering glares.

These experts suggest, too, that in retail store window displays, watches should be placed as close to the viewer as possible with special care taken to establish convenient eye levels and focal points. The most attractive windows at the Basel Fair make maximum use of three-dimensional composition to draw the eyes of passersby past the window-front watches and displays—into the store.

industry News

J-B Offers Advertising Display Unit

■ JACOBY - BENDER, INC., manufacturers of J-B watch bands, is making available to jewelers a display unit designed to tie-in with the "Stop the Music" advertising campaign on radio and television from coast to coast.

The unit features two new J-B watch bands—a gent's full expansion (the Plainsman) in yellow gold filled, and a new band for ladies (the Golden Wisp). Each band will retail for $6.96 FTI.

J-B will supply this unit in two ways—either with one each of the two bands mentioned above, or with two of each. The extra bands can be stored in a pocket on the back of the display, thus making it possible for the jeweler to sell bands directly from the display.

Expanded Program for Industry Council

■ THE ANNUAL MEETING of the board of directors of the Jewelry Industry Council, held in New York on January 15, 1955, was marked by approval of an expanded program of operations; announcement of a change in the time of year for the Council's annual membership meeting; the re-election for 1955 of all officers who served the Council in 1954; and reports on the results of Council's mail ballot for election of retailer and supplier directors.

Approval was given to the Council's basic program of operations—a program that calls for the continuous publicizing of the products of the jewelry industry to the American public and for a year-around promotional service to the retail jewelers aimed at helping them increase sales.

Approval was also given for creating special manuals for retail jewelers on "How to Conduct Clearance Sales" and on "Club Plan Selling" and for the establishment by the Council of an official list on symbols to be used to signify anniversaries of businesses, colleges, societies and other types of economic and social institutions.

Approval of the latter of these three projects was given on the basis of widespread requests received by the Council

for such a list from many types of economic and social organizations.

In addition, the Council was authorized (1) to carry on exploratory work looking toward a coordinated nation-wide promotion aimed at increased sales of Christmas gifts in jewelry stores in the 1955 Christmas Season; (2) to engage in exploratory work on the feasibility of establishing an advertising art service for retail jewelers; and (3) to consider the possibility of establishing an official list of awards that could be used by businesses and institutions to honor employees according to the length of service of employees.

Continuation of a program for increased membership, a program which brought in 568 new members in 1954, was also approved.

Unanimous approval was given New York as the place for the 1955 meeting of the general membership meeting of the Council. Approval was also given to August as the month of the meeting.

Precise Watch Timer Now On Market

■ THE PRECISE TIMER COMPANY of West Branch, Michigan, recently introduced to the watchmaker trade its new Precise Watch Timer, an electronic instrument employing a sensitive amplified system.

Impulses from the watch movement under test are heard through a speaker, and are also impressed on a visual device in such a manner that a diagnosis of rate and escapement action may be made.

Through a means of making dynamic tests, resuming and recovery rates are available, and conditions under which the movement must operate can be duplicated.

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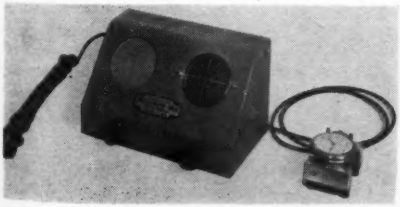

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Omega 'Beat-Per-Hour' Data Card Available

■ UNLIKE STANDARD 18,000 beat-per-hour movements, a watch with a fast-beat or "off-beat" movement requires special settings for accuracy check-ups on a Watch-Master machine. The exact beat-per-hour speed must be known or the Watch-Master tape-markings may be incorrectly interpreted.

The majority of Omega high-precision movements are of the "fast-beat" type, with beat-per-hour speeds from 19,440 to as high as 21,600. For the convenience of the watchmaker, Omega has listed all its movement calibers and beat-per-hour speed on a handy card. Copies of this helpful card are available free, on request, from Norman M. Morris Corporation, 655 Madison Avenue, New York 21.

Elgin to Help Stimulate Jewelers' Sales

■ FIFTY-SIX all new models at special introductory prices will help jewelers stimulate sales this spring, Elgin National Watch Company has announced, when it launches its third annual "Banner Buy," March 9 through April 9.

Heading the list of models at introductory prices is a new demi-size lady's watch for $33.75. Elgin will also introduce a new series of 19-jewel ladies' diamond watches at $65.00.

Among the men's models is a self-winding, water and shock resistant watch for $49.50, and a solid gold, 10k, 19-jewel watch at the introductory price of $75.00. All prices mentioned are retail and include federal tax.

Savings on some models run as high as $25.00, according to the firm, with large

scale savings being offered to both jeweler and consumer during the promotion. At the end of the promotion, special introductory fair trade prices will be increased to a permanently higher level. Price ranges during the promotion from $29.75 to $100.00 have been scheduled to attract all classes of customers.

A complete promotional package has been developed by Elgin's advertising department. Highlighting the effort will be the "Elgin Hour," beamed at the television audience, and commercials will feature the "Banner Buy" theme in motion display form which has been developed for jewelers' windows during the promotion.

New Package for 'Beau Brummel' Line

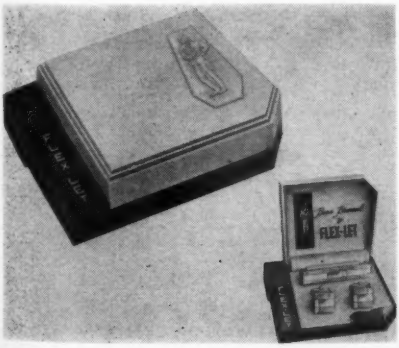
A NEW men's jewelry gift box has been introduced as the standard package for Flex-Let's line of Beau Brummel gentlemen's jewelry.

It is styled in two-tone grey plastic with an embossed figure of Beau Brummel on the cover and golden cut-out letter for a vertical reading "Flex-Let" on the left side of the box.

The cover has a durable spring hinge and when open reveals a figure of Beau Brummel silhouetted against a crimson background printed on white satin.

Jewelry is displayed in the new box on specially die-cut forms of light grey faille rep silk. The entire line of Beau Brummel men's jewelry comes packaged in this new gift box.

Available from Flex-Let Corporation, 580 Fifth Ave., New York 36, N. Y.



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WATCH MATERIALS — JEWELERS' SUPPLIES
JEWELRY — FINDINGS
Room 215-218, 320 Superior St. Toledo, Ohio

Watch Inspection Time Dates Set

■ AFTER CONSULTATION with leaders of the jewelry and horological industry, dates have been set for two important 1955 promotional events—Watch Inspection Time and the Watch Fashion Parade.

Watch Inspection Time this year will take place September 8-17, with the Watch Fashion Parade following October 27-November 5. This will mark the seventh consecutive year the promotions are to be held as an aid to retail jewelers and watchmakers throughout the country. Further details will be released to jewelers and watchmakers in coming months as complete plans develop.

Paul A. Tschudin, director of The Watchmakers of Switzerland Information Center, Inc., has again pledged support for the promotions. Mr. Tschudin indicated that retailer enthusiasm for these presentations is high because of the considerable consumer attention and traffic they stimulate.

'National Jewelry Week' April 22-28

■ RETAIL JEWELRY STORES throughout the country are scheduled for a husky sales boost from the National Wholesale Jeweler's Association. According to an announcement by Milton Freudenheim, president of the NWJA, the association is sponsoring the first National Jewelry Week in history, to be celebrated April 22-28. Leading manufacturers and retail jewelry stores from coast to coast are cooperating with NWJA wholesalers in the program.

A comprehensive merchandising program will support top-level advertising and publicity campaigns leading up to the event. Materials of all kinds to help the retailer make the most of the potentialities created by the national program are included.

National Jewelry Week is the climax of a two-sided campaign to stimulate jewelry store sales early in the spring season. One aspect will be directed straight at the customer via publicity and consumer advertising; the other starts with the manufacturer, reaching down through the wholesaler to center on the individual retailer.

Lewin, Williams and Saylor of New York have developed a dramatic advertising campaign, including coverage in the jewelry trade press, that will culminate in a double-page spread in LIFE magazine's April 25 issue. The advertisement will reach LIFE's 26 million readers, while reprints of the double page and window display streamers featuring it will greatly multiply that figure.

All this will be supplemented by a solid merchandising program for retailers. Merchandising kits will contain stickers, buttons, newspaper mats, sample ads for local use, counter and window display items.

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JUST A FEW MORE PAYMENTS (while it pays for itself)
Watch
Master
SEALED-IN ACCURACY (1 part in 100,000) everywhere in all weather. (Compare)
WATCH RECORDS Easiest to read Clearest for analysis (Compare)
DEPENDABILITY IN OPERATION day in and day out (Compare)
LONG LIFE Greatest value in the long run. Ask any user

Day-in and day-out advantages... long life and dependable operation... those are just two of the many reasons why there are more WatchMasters sold than all other watch-timing machines in the world, combined.

American Time Products, Inc.
580 Fifth Ave., New York 36,

Gentlemen,

Please arrange a demonstration of the WatchMaster at my bench so that I may judge for myself its operating advantages and long-range economy.

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